



December 11, 2013

Attn: Director of Certification

Dear Sir or Madam:

The following is the Maximum Permissible Exposure (MPE) calculation for the FlexWave™ Prism – 700 MHz Lower ABC/Upper C, FCC ID: F8I-PSM7A7UD using the system’s maximum RF emission.

The calculation is based on FCC 47CFR Part 2 and OET 65.

Per OET 65:

Maximum Permissible Exposure is $\text{Freq. (MHz)}/1500 = \text{MPE mW/cm}^2$

1) For Lower ABC (Freq. 737 MHz)

$$\text{MPE} = 737 / 1500 = 0.4913 \text{ mW/cm}^2 = 4.913 \text{ W/m}^2$$

The following equations determine the distance from the antenna that the Power Density (S) is: $S \leq 4.913 \text{ W/m}^2$.

The Maximum Conducted Transmitter Power (P) is 27.22 W or 44.35 dBm.

The Effective Radiated Power (ERP) Limit according to FCC §25.50(b) is 1000 W or 60 dBm

Therefore, the maximum allowed Antenna Gain is $G_d \leq 15.65 \text{ dBd}$ (relative to halve-wave dipole) or $G \leq 17.8 \text{ dBi}$ or $G \leq 60.26$

Power Density

$$S = (P \times G) / (4 \times \pi \times D^2) \quad (1)$$

Minimum distance

$$D \geq \sqrt{(P \times G) / (4 \times \pi \times S)} \quad (2)$$

From (2)

$$D \geq \sqrt{(27.22 \times 60.26) / (4 \times \pi \times 4.91)} = 5.15 \text{ m}$$



2) Upper C (Freq. 751 MHz)

$$\text{MPE} = 751 / 1500 = 0.50 \text{ mW/cm}^2 = 5.0 \text{ W/m}^2$$

The following equations determine the distance from the antenna that the Power Density (S) is: $S \leq 5.0 \text{ W/m}^2$.

The Maximum Conducted Transmitter Power (P) is 24.77 W or 43.94 dBm.

The Effective Radiated Power (ERP) Limit according to FCC §25.50(b) is 1000 W or 60 dBm

Therefore, the maximum allowed Antenna Gain is $G_d \leq 16.06 \text{ dBd}$ (relative to half-wave dipole) or $G \leq 18.2 \text{ dBi}$ or $G \leq 60.22$

From (2)

$$D \geq \sqrt{(24.77 \times 60.22) / (4 \times \pi \times 5.0)} = 4.87 \text{ m}$$

In addition, the following statement will be added to our installation/operation manual:
To comply with Maximum Permissible Exposure (MPE) requirements, the maximum composite output from the antenna cannot exceed 1000 Watts ERP and the antenna must be permanently installed in a fixed location that provides at least 6 meters (20 feet) of separation from all persons.

Sincerely,

A handwritten signature in black ink, appearing to read 'Joshua J. Wittman', is written over a horizontal line.

Joshua J. Wittman

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