

§ 15.407(f) RF Exposure

RF Exposure Requirements: §1.1307(b)(1) and §1.1307(b)(2): 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 of the Commission's guidelines.

RF Radiation Exposure Limit: §1.1310: As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

MPE Limit Calculation: EUT's operating frequencies @ 5150 - 5250 MHz; highest conducted power = 57.42 mW (i.e. 17.59 dBm) (avg) therefore, **Limit for Uncontrolled exposure: 1 mW/cm² or 10 W/m²**

EUT antenna gain = 29 dBi.

Equation from page 19 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2$$

where, S = Power Density

P = Power Input to antenna

G = Antenna Gain (numeric value = 10^{^(dB/10)})

R = Distance to the center of Radiation of the antenna

$$P = 57.42 \text{ mW}$$

$$R = 61 \text{ cm}$$

$$G = 29 \text{ dBi (numeric value 794.33)}$$

$$S = 57.42 \times 794.33 / 4 \times \pi \times 61^2$$

$$S = .98 \text{ mW/cm}^2$$

Therefore, EUT meets the Uncontrolled Exposure limit at 61 cm. The MPE measurement is higher for a 29 dBi antenna and its associated conducted power.

MPE Limit Calculation: EUT's operating frequencies @ 5725 - 5850 MHz; highest conducted power = 217.84 mW (i.e.23.38 dBm) (avg) therefore, **Limit for Uncontrolled exposure: 1 mW/cm² or 10 W/m²**

EUT maximum antenna gain = 29 dBi.

Equation from page 19 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2$$

where, S = Power Density

P = Power Input to antenna

G = Antenna Gain (numeric value = 10^{^(dB/10)})

R = Distance to the center of Radiation of the antenna

$$P = 217.84 \text{ mW}$$

$$R = 118 \text{ cm}$$

$$G = 29 \text{ dBi (numeric value 794.33)}$$

$$S = 217.84 \times 794.33 / 4 \times \pi \times 118^2$$

$$S = .99 \text{ mW/cm}^2$$

Therefore, EUT meets the Uncontrolled Exposure limit at 118 cm. The MPE measurement is higher for a 29 dBi antenna and its associated conducted power.