Plextek

Technical Note

Subject: **OET 65 MPE Calcluation**

From: Plextek

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The following is based on the methods of the FCC Office of Engineering & Technology Bulletin 65, edition 97-01 dated August 1997, entitled "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields".

Our measured ERP of +30dBm or 1W corresponds to an EIRP of 1.64W (the gain of a half-wave dipole relative to an isotropic radiator being 1.64, as stated on page 20 of the above document).

This power is that applied to the antenna during the period when the output stage of the transmitter is active. Taking the maximum 20% duty cycle of the transmitter into account, the mean EIRP is equal to 0.2 x 1.64W = 0.328W

Equation 4 (page 19), gives the power density (S) as a function of range (R) as:

$$S = EIRP/(4\pi R^2)$$

It is noted on page 19 of the above document that "These equations are generally accurate in the far-field of an antenna but will over-predict power density in the near field, where they could be used for making a "worst case" or conservative prediction". Although this equation cannot be expected to yield an accurate result at a range as low as that under consideration here (20cm), on this basis in line with OET 65 we have however taken the result of this equation as a conservative indication as to whether a problem may exist.

The maximum value of S allowed at the frequency of operation of this transmitter is 0.2mW/cm^2 (2W/m^2) at a distance of 20cm or greater from the antenna (from Table 1(B)). Substituting into the above equation yields:

$$0.328 /(4\pi R^2) = 2$$

Giving a conservative value for the distance at which the power density is 0.2mW/cm^2 of **11.4cm**.

Conversely, at a distance of 20cm from the antenna:

$$S = 0.328/(4\pi \times 0.2^2)$$

Yielding a conservative value for the power density at a distance of 20cm from the antenna of **0.065mW/cm^2**.