

28 February 2007

MPE Calculation for 2776 DAS System

The FCC requires that the calculated MPE be equal to or less than a given limit dependent on frequency at a distance of 20 cm from a device to the body of a user.

The overall transmitter frequency range of operation considered for the 2776 DAS Antenna Unit (AU) is 869MHz to 1990MHz. This covers GSM800 and PCS1900 operating bands.

The transmitter power value used is the maximum measured system average broadband power for all combinations of service feeds to the antenna. Each individual service is not capable of reaching this power.

The equation for the MPE calculation is given in OET Bulletin 65, page 19 as:

$$S = \text{EIRP} / 4 \pi R^2$$

Where S = Power density

EIRP = Effective Isotropically Radiated Power (EIRP = P x G)

R = distance to the centre of radiation of the antenna

Values Output power (P) : +18.0dBm conducted max

Antenna gain (G) : 8dBi (from 2776 DAS technical specification)

R = 20cm

Calculation

$$S = \text{EIRP} / 4 \pi R^2$$

$$S = 65 \times 6.31 / (12.56 \times 20^2)$$

$$S = 0.082 \text{ mW/cm}^2$$

For the 2776 DAS @ 869MHz at 20cm distance

$$S = f/1500 \text{ mW/cm}^2 \text{ (f = operating frequency)}$$

(from table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC Rule Part 1.1310)

$$S = 869/1500 = 0.579 \text{ mW/cm}^2$$

For the 2776 DAS @ 1930MHz at 20cm distance

$S = 1.0 \text{ mW/cm}^2$ (from table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC Rule Part 1.1)

$$S = 1.0 \text{ mW/cm}^2$$

Conclusion

The 0.082 mW/cm^2 MPE value of the 2776 DAS at 20 cm meets the RF exposure limits.