

Power Density Calculations

The power density that would result at any given point with line-of-sight from any given transmitter/antenna system can be calculated using an equation given in FCC OET Bulletin 65:

$$S = \frac{33.4 (F_{az})^2 (F_{el})^2 ERP}{R^2}$$

Where

S= power density in $\mu\text{W}/\text{cm}^2$

F_{az} = antenna azimuth relative field factor

F_{el} = antenna elevation relative field factor

ERP= Effective Radiated Power in watts

R= distance from antenna to point of interest in meters

This equation includes compensation for power density increase due to possible ground reflections.

Note: Only 55% of the FCC stated ERP of analog TV stations has been entered in the spreadsheets for analog TV stations to account for average video power and aural carrier contributions. For digital stations, ERP is average power by definition.