

RF Exposure Information

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density
P = power input to the antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

When all the antennas are at least 20cm away from the user, but individual antennas can not be separated by 20cm from each other.

If

$$[Pd(1) / LPd(1)] + [Pd(2) / LPd(2)] + + [Pd(n) / LPd(n)] < 1,$$

Then, the device complies with FCC's RF radiation exposure limit for general population as a mobile device (d>20cm).

Where;

Pd(n) = Power density of nth transmitter at 20cm
LPd(n) = Power density limit for the nth transmitter

For 2.4GHz transmitter:

S = 0.0093mW/cm² at 20cm (Conducted Power = 46.8mW and Antenna Gain = 0dBi)
S_{limit} = 1.0mW/cm²

For FM transmitter:

S = 0.0016mW/cm² at 20cm (ERP=4.9mW and EIRP=8.1mW)
S_{limit} = 0.2mW/cm²

Calculation: (Pd(2.4GHz) / LPd(2.4GHz)) + (Pd(FM) / LPd(FM)) = 0.0173 mW/cm² < 1