IDX8000NA RF Exposure Analysis

1.1 RF Exposure Compliance Requirements

Operating Band Center Frequency = 915 MHz
EUT Output Power = +30 dBm = 1 Watt
Antenna Gain = 6 dBi => Numeric Gain = 4

Power Density Limit for General Population from CFR 47 Part 1.1310, Table 1 is:
S = F(MHz) / 1500 => 928/1500 = 0.62 mW / cm^2 (used high end of 915 MHz band)

Power Density at 25 cm = 0.51 mW/cm^2
Minimum MPE safe distance (using equation below) = 23 cm

Assuming 1 watt output power into a maximum 6 dBi gain antenna, neglecting for cable losses to the antenna gives a 4 watt EIRP output.

Calculations from FCC OET-65, Sec. 2, Equation 3)

Power Density S = (Pt*G)/ (4*pi*d^2)
S = (1000mWatt*4gain)/ (4*pi*25^2) at 25 cm distance
S = (4000)/ (7854) = 0.51 mW/cm^2

Or to find the safe distance that meets the MPE limit;

Power Density S = (Pt*G)/ (4*pi*d^2)
Solve for d, the minimum safe distance to meet the MPE limit.
d^2 = (Pt*G)/ (4*pi*S)
d = SqrRoot((Pt*G)/(4*pi*S))
d = SqrRoot((1000mWatt*4gain)/(4*pi*0.62 mW/cm^2)
d = SqrRoot((4000mW/4*pi*0.62)mW/cm^2)
d = SqrRoot(1000/pi*0.62)cm
d = 23 cm

Where
Pt= Transmit Power to the antenna in mWatts
G = Numeric Antenna Gain
d = Distance in centimeters
S = Power Density in mW / square cm