IDX9000 RF Exposure Analysis

RF Exposure Compliance Requirements

Operating Band Center Frequency = 915 MHz
EUT Output Power = +30 dBm
Antenna Gain = 6 dBi => Numeric Gain = 4
Power Density Limit for General Population is
S = F(MHz) / 1500 = 0.61 mW / cm^2 or 6100 W/m^2
(CFR 47 Part 1.1310, Table 1)

Minimum MPE safe distance (using equation below) = 10.2mm

Calculations:
Assuming 1 watt output power into a maximum 6 dBi gain antenna, neglecting for cable losses to the antenna gives a 2 watt total output.

Power Density Pd = (Pt*G)/(4*pi*d^2)
Pd = (2watt*4gain)/(4*pi*0.25^2) at 25 cm distance
Pd = (8)/(0.785) = 10.2 W/m^2 where limit is 6100 W/m^2

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

Power Density Pd = (Pt*G)/(4*pi*d^2)
Solve for d, the minimum safe distance to meet the MPE limit.
d^2 = (Pt*G)/(4*pi*Pd)
d = SqrRoot((Pt*G)/(4*pi*Pd))
d = SqrRoot((2watt*4gain)/(4*pi*6100watt/m^2)
d = SqrRoot((2/pi*6100)m^2)
d = SqrRoot(2/pi*6100)m
d = 0.0102meters = 10.2 mm

Where
E = Field Strength in Volts/meter
Pt= Transmit Power In Watts
G = Numeric Antenna Gain
d = Distance in Meters
Pd = Power Density in W / square m