

Appendix A: FCC RF Exposure §1.1307, §1.1310, §2.1091, §2.1093

Using FCC 1.1310 Table 1B as guidance, the maximum permissible RF exposure for an controlled environment is $f/300 \text{ mW/cm}^2 = 3.0 \text{ mW/cm}^2$ for the frequencies used in this device (903.0 to 927.0 MHz).

The worst-case power is used for the calculation below. The actual power density for the EUT calculated as shown below.

$$S = (P \times G) / (4 \times \pi \times d^2)$$

where:

S = power density

P = transmitter conducted power in (mW)

G = antenna numeric gain

d = distance to radiation center (cm)

Frequency (MHz)	Sector Antenna Gain (dBi)	Conducted Power (mW)	Calculated Power Density (mW/cm ²)	Power Density Limit (mW/cm ²)
915, 927	17	119.8	1.5	3

Note: The 915 MHz and 927 MHz bonded pair channels represent the worst-case power at 119.8 mW.

119.8 mW increased 1 dB (1.2589) for tune up = 158.82 mW; 158.82 mW x 50 (numeric gain) = 7541 mW
EIRP = 7541 mW.

FCC Radiation Exposure

The calculated power density is below the controlled limit. The minimum separation distance for this equipment, which is a mobile/fixed device, is <20 cm.

Maximum antenna gain: 17 dBi = 50.0 numeric

Maximum measured power: 119 mW conducted; 1 dB added for tune up procedure = 7541 mW.

Maximum EIRP = 7.541 W

Using the controlled limit from FCC 1.1310 Table 1B:

Limits: FCC S = power density ($\text{mW/cm}^2 = f/300 \text{ mW/cm}^2 = 3.0 \text{ mW/cm}^2$)

Equation used: $d = \sqrt{EIRP/4\pi S}$

FCC Minimum Safe Distance: $d = \sqrt{7541/37.7} = 14.14 \text{ cm}$

The calculated minimum safe distance is 14.14 cm for controlled exposure at 3.0 mW/cm².

At a 20 cm distance, the power density is 1.5 mW/cm², which is well below the 3.0 mW/cm² limit for controlled exposure. This means the equipment meets FCC radiation exposure guidelines with a safe distance of 20 cm.