

RF Exposure evaluation of safe distance
according to FCC CFR 47, Part 1.1307, 1.1310; RSS-102, Issue 5,
Safety Code 6

A calculation was done to confirm the required safe distance for fixed device.

Limit for power density for general population/uncontrolled exposure is 1 mW/cm² for the frequency range 1500 -100000 MHz.

The power density P (mW/cm²) = $P_T / 4\pi r^2$, where
 P_T = the maximum equivalent isotropically radiated power (EIRP).

The minimum safe distance “r”, where RF exposure does not exceed FCC permissible limit, is:

$$r = \sqrt{P_T / (P \times 4\pi)}$$

For 12 cm antenna

The maximum rms output power is 9.1 dBm and max antenna gain is 36 dBi. This corresponds to the equivalent isotropically radiated power (EIRP) of 9.1 dBm + 36 dBi = 45.1 dBm, which is equal to 32359 mW.

$$r = \sqrt{P_T / (P \times 4\pi)} = \sqrt{32359 / 12.56} = \mathbf{51 \text{ cm. or } 0.51 \text{ meters.}}$$

For 30 cm antenna

The maximum rms output power is 9.1 dBm and max antenna gain is 42 dBi. This corresponds to the equivalent isotropically radiated power (EIRP) of 9.1 dBm + 42 dBi = 51.1 dBm, which is equal to 128825 mW.

$$r = \sqrt{P_T / (P \times 4\pi)} = \sqrt{128825 / 12.56} = \mathbf{101 \text{ cm. or } 1.01 \text{ meters.}}$$

For 60 cm antenna

The maximum rms output power is 9.1 dBm and max antenna gain is 47 dBi. This corresponds to the equivalent isotropically radiated power (EIRP) of 9.1 dBm + 47 dBi = 56.1 dBm, which is equal to 407380 mW.

$$r = \sqrt{P_T / (P \times 4\pi)} = \sqrt{407380 / 12.56} = \mathbf{180 \text{ cm. or } 1.8 \text{ meters.}}$$

Information about safe distance shall be provided in the User Manual.

The device must be installed so as to maintain the following minimum separation distance between the main lobe of the transmit antenna and nearby persons.

Configuration	Antenna size	Antenna gain	Minimum separation
60 SX	12 cm	36 dBi	52 cm.
60 MX	30 cm.	42 dBi	101 cm.
60 LX	60 cm.	47 dBi	1.8 meters