

RF Exposure MPE Exhibit

FCC ID: S52-1-09-00-00-1
IC: 8076A-10900001

This device operates at frequencies in the 800 MHz Cellular Band. Maximum permissible exposure in this band is specified under per FCC Part 1, Section 1.1310, Table 1, as $f/1500$ mW/cm^2 ($0.58\text{mW}/\text{cm}^2$ at 869 MHz). FCC Part 1, Section 1.1307 states that Part 22 Subpart H devices are excluded from routine environmental evaluation when the operating total power level of all channels is less than 1640 Watts EIRP.

EIRP (Effective Isotropic Radiated Power) is the amount of power that a theoretical isotropic antenna (that evenly distributes power in all directions) would emit to produce the peak power density observed in the direction of maximum antenna gain. EIRP can take into account the losses in transmission line and connectors and includes the gain of the antenna.

Where $EIRP$ and P_t (power of transmitter) are in dBm, cable losses (L_c) is in dB, and antenna gain (G_a) is expressed in dBi, relative to a (theoretical) isotropic reference antenna. No antenna is supplied with this unit. Therefore, based on maximum measured RF output power of 60.26 Watts Peak (47.8 dBm) at 879.27 MHz and assumption of cable loss is zero, the maximum antenna gain that will allow the EIRP to remain under the environmental evaluation exclusion limit of 1640 Watts is 14.35 dBi.

MPE is determined by the following relationship:

$$\text{Power Density } P_d (\text{mW}/\text{cm}^2) = EIRP/4\pi d^2$$

Where d = distance

$$1640 \text{ Watts} = 1.64 \times 10^6 \text{ mW}$$

Therefore:

$$\begin{aligned} d &= \sqrt{(EIRP/4\pi P_d)} \\ &= \sqrt{(1.64 \times 10^6 \text{ mW} / 4\pi (0.58 \text{ mW}/\text{cm}^2))} \\ &= 4.7 \text{ m} \end{aligned}$$

The minimum safe distance from a radiating structure exhibiting a maximum gain of 14.35 dBi connected to the BTS when installed and transmitting at full output power is 4.7 m.

The antenna(s) used for this transmitter must be fixed-mounted on permanent outdoor structures. RF exposure compliance is addressed at the time of licensing, as required by the responsible FCC Bureau(s), including antenna co-location requirements of Section 1.1037(b)(3).