

RF Safety Requirements to 2.1091 for Mobile Transmitters

The unit under evaluation has an integral antenna. The maximum field strength from this device was 113.5 dB(μV/m). The ERP of this device was measured to be 16 dBm (40 mW). Using the following equation, this converts to an EIRP of 67 mW.

$$E_{V/m} = \frac{\sqrt{30P_t G_t}}{r}$$

where:

$E_{V/m}$ = the field strength in V/m

P_t = power transmitted (W)

G_t = Numeric gain of the transmitting antenna

r = separation distance in meters (3 meters was the test distance used)

Solving for the $P_t G_t$ term gives the EIRP.

MPE calculations:

The uncontrolled exposure limits are 0.62 mW/cm² at 923.85 MHz.

Using the power density equation:

$$P_d = \frac{P_t G_t}{4\pi r^2}$$

Solving for distance r yields the following equation.

$$r = \sqrt{\frac{P_t G_t}{4\pi P_d}}$$

Inserting the values and solving for r yields $r = 2.9$ cm.

The power density equation shows that the minimum separation distance to be 2.9 cm. Since the EUT is considered to be a mobile unit, which by definition specifies that the antenna distance is greater than 20 cm, the manual incorporates a caution statement that states that the unit should only be used when a separation of 20 cm is maintained between the antenna and users. This ensures compliance with the MPE requirements.