

Maximum permissible emissions (MPE)

The transmitting power P_{tx} is nominal $2 * 14\text{dBm} = 17\text{dBm}$. The transmitting antenna gain G_{tx} is at maximum direction 15dB . The maximum equivalent isotropic radiated power EIRP of the TMC3J consequently:

$$\text{EIRP}_{\text{max}} = P_{tx} * G_{tx} = 32\text{dBm} (1.6\text{W})$$

From the EIRP the power density ρ can be calculated using the equation below:

$$\rho = \frac{\text{EIRP}}{4 * \pi * D^2} \quad [1]$$

where D is the distance from the transmitting antenna.

Equation [1] assumes that the distance D is large enough to be in the far field of the antenna. In the near field of the antenna, the power density ρ will be less than what is obtained from equation [1]. The far field distance (Rayleigh distance) of the antenna is about 0.45 m

$$(R \gg \frac{2 * D_{ant}^2}{\lambda})$$

Using equation [1] with the nominal EIRP of 32dBm at distance greater than 20 cm , the maximum power density is below 0.32mW/cm^2 .

The MPE of the TMC3J is consequently far under the limit specified in FCC OET bulletin 65 of 5mW/cm^2 and 1mW/cm^2 for both controlled and uncontrolled exposure respectively.