

MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 19 of OET Bulletin 65, Edition 97-01

$$S = \frac{EIRP}{4\pi R^2}$$

where:

S = power density (in appropriate units, e.g. mW/cm²)

EIRP = equivalent (or effective) isotropically radiated power (in appropriate units, e.g., mW)

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, r =20cm, as well as the gain of the used antenna is 2dBi, the RF power density can be obtained. So, the worst result is below:

Bluetooth:

Max Output Power = 0.097 dBm, Ant gain 2dBi

EIRP=PG= (0.097+2.0) dBm=2.097 dBm=10^(2.097/10) mW=1.62mW

$$\text{So, } S = \frac{EIRP}{4\pi R^2} = \frac{1.62}{4\pi \times 20^2} = \underline{0.0003} \text{mW/cm}^2 < 1.0 \text{ mW/cm}^2$$

Wi-Fi:

Max Output Power = 9.767 dBm, Ant gain 2dBi

EIRP=PG= (9.767+2.0) dBm=11.767 dBm=10^(11.767/10) mW=15.02mW

$$\text{So, } S = \frac{EIRP}{4\pi R^2} = \frac{15.02}{4\pi \times 20^2} = \underline{0.0030} \text{mW/cm}^2 < 1.0 \text{ mW/cm}^2$$

Bluetooth and Wi-Fi can transmit at the same time, so,

$$S = (0.0003 + 0.0030) \text{ mW/cm}^2 = 0.0033 \text{ mW/cm}^2 < 1.0 \text{ mW/cm}^2$$

Conclusion: **Pass.**