

5.10 RF Exposure Compliance Requirement

5.10.1 Standard requirement

15.247(b)(4) requirement:

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.10.2 EUT RF Exposure

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

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

P = power input to the antenna (in appropriate units, e.g., mW) .

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

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

Maximum peak output power at antenna input terminal: -3.11dBm (0.489mw)

Prediction distance: >20 (cm)

Predication frequency: 2402 (MHz)

Antenna Gain (typical): 2.0(dBi)

Antenna Gain (typical): 1.58 (numeric)

The worst case is power density at predication frequency at 20 cm :

$$\begin{aligned} \text{Power density } S &= PG/4\pi R^2 = 0.489\text{mW} \times 1.58 / (4 \times 3.14 \times 20^2) \\ &= 0.000154 \text{ mW/cm}^2 \end{aligned}$$

MPE limit for general population exposure at prediction frequency:1 (mW/cm²)

< .

Note: For mobile or fixed location transmitters, the minimum separation distance is 20cm, even if calculations indicate that the MPE distance would be less.