

Maximum Permissible Exposure

Applicable Standard

According to §1.1307(b)(5), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

For 2.4G WIFI

Remark: 1) The maximum output power for Output 0 is 23.83dBm (241.55 mW) at 2462MHz, (with 3.98 numeric antenna gain.)

2) The maximum output power for Output 1 is 24.55 dBm (285.10mW) at 2412MHz, (with 3.98 numeric antenna gain.)

4) For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20cm, even if the calculation indicate that the MPE distance would be lesser.

Calculation

Given $E = \sqrt{\frac{30 \times P \times G}{d}}$ & $S = \frac{E^2}{3770}$

Where E = Field Strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts / square centimeter

Maximum Permissible Exposure

Antenna 1 output power=241.55mW, **Antenna 2** output power=285.10mW,

Numeric Antenna gain=3.98

Substituting the MPE safe distance using d=20cm into above equation.

Yields:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW/cm²

Total Power density = $0.19 + 0.23 = 0.42 \text{ mW/cm}^2$

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.)

For 5G WIFI

Remark: 1) The maximum output power for Output 0 is 20.98 dBm (125.31mW) at 5745MHz, (with 7.9 numeric antenna gain.)

2) The maximum output power for Output 1 is 20.95 dBm (124.45mW) at 5725MHz, (with 7.9 numeric antenna gain.)

Maximum Permissible Exposure

Antenna 1 output power=125.31mW, **Antenna 2** output power=124.45mW,

Numeric Antenna gain=7.9

Substituting the MPE safe distance using d=20cm into above equation.

Yields:

$$S=0.000199*P*G$$

Where P =Power in mW

G =Numeric antenna gain

S =Power density in mW/cm²

$$\text{Total Power density} = 0.197 + 0.196 = 0.393 \text{ mW/cm}^2$$

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.)

For 2.4GHz and 5GHz simultaneous transmitter RF exposure:

$$\text{Total Power density} = 0.42 + 0.393 \text{ mW/cm}^2 = 0.813 \text{ mW/cm}^2 < 1 \text{ mW/cm}^2.$$

Result: PASS.