



Aruba Wireless Networks

TUVR32-A3 AP70 Wireless Access Point

Maximum Permissible Exposure

FCC, Part 15 Subpart C §15.407(f)
Industry Canada RSS-210 §14

Calculations for Maximum Permissible Exposure Levels

Given

$$E = \sqrt{(30 * P * G)} / d$$

and

$$S = E^2 / 3770$$

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

Combining and rearranging the terms to express the distance as a function of the variables, yields:

$$d = \sqrt{(30 * P * G)} / (3770 * S)$$

Rearrange to milliwatts and centimeters

$$P(\text{mw}) = P(\text{watts}) / 1000$$

$$d(\text{cm}) = d(\text{m}) * 100$$

yields

$$d = 100 * \sqrt{(30 * (P / 1000) * G)} / (3770 * S)$$

$$d = 0.282 * \sqrt{(P * G / S)}$$

where

d = distance in centimetres



P = Power in mW
G = Numeric Antenna Gain
S = Power Density in centimetres²

Substituting the logarithmic form of power and gain using:

$$P(\text{mW}) = 10^{(P(\text{dBm})/10)} \text{ and}$$

$$G(\text{numeric}) = 10^{(G(\text{dBi})/10)}$$

Yields:

$$d = 0.282 * 10^{((P + G / 20) \sqrt{S}}$$

where

d = MPE distance in centimetres
P = Power in dBm
G = Antenna Gain in dBi
S = Power Density Limit in mW / centimetres² (Limit S = 1mW / cm² from §1.310 Table 1)

Maximum peak output power observed from power measurements: **+16.86dBm**

Maximum Declared Antenna Gain: **14.0dBi**

Power Density Limit (mW / cm ²)	Maximum Measured Peak Output Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)
1	+16.86	14.0	10.0

Specification

Maximum Permissible Exposure Limits

15.407(f)

§1.1093, §2.1091, §2.1093 U-NII devices are subject to the radio frequency radiation exposure requirements within the above paragraphs as appropriate. All equipment shall be considered to operate in a “general population/controlled” environment”.

Limit S = 1mW / cm² from 1.310 Table 1

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

RSS-210 §14 Before equipment certification is granted, the procedures of RSS-102 must be followed concerning exposure of humans to RF fields.