Title: Test of Aruba Networks AP60 802.11a/b/g
Access Point
To: FCC 47 CFR Part 15.247,15.407,IC RSS-210
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4.2.1.3 Maximum Permissible Exposure

FCC, Part 15 Subpart C §15.247(b)(5)
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(mw) = P(watts) / 1000

d(cm) = d(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 centimetres^2

Substituting the logarithmic form of power and gain using:

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

G(numeric) = 10 ^ (G(dBi) /10)

Yields:

d = 0.282 * 10 ^ ((P + G / 20) √ S

where

d = MPE distance in centimetres
P = Power in dBm
G = Antenna Gain in dBi
S = Power Density Limit in mW / centimetres^2 (Limit S = 1mW / cm^2 from §1.310 Table 1)

Maximum output power observed from power measurements – +19.7dBm

Power Density Limit (mW / cm^2)	Maximum Measured Output Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)
1	+19.7	12	38.5

Specification

Maximum Permissible Exposure Limits

§15.247 (b)(5) Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency levels in excess of the Commission's guidelines.   See §1.1307 (b)(1) of this chapter.

Limit S = 1mW / cm^2 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.

Traceability

METHOD	TEST EQUIPMENT USED
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	Bar 1, RVA 01, K-CBL 8, K-CBL 10, S-Anlr 1

Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty (dB)	±1.33