



APPENDIX I

RADIO FREQUENCY EXPOSURE

LIMIT

According to §15.247(i), 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 energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

According to RSS-Gen §5.5, before equipment certification is granted, the applicable requirements of RSS-102 shall be met.

EUT Specification

EUT	Single Radio Access Point AP1014
Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Others
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure ($S = 5\text{mW/cm}^2$) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure ($S=1\text{mW/cm}^2$)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input checked="" type="checkbox"/> Tx/Rx diversity
Max. output power	IEEE 802.11b mode: 19.91 dBm (97.9490 mW) IEEE 802.11g mode: 22.11 dBm (162.5549 mW) IEEE 802.11n HT 20 MHz mode: 21.95 dBm (156.6751 mW) IEEE 802.11n HT 40 MHz mode: 22.01 dBm (158.8547 mW)
Antenna gain (Max)	1. Part No: 260-23292: 2.61 dBi (Numeric gain: 1.82) 2. Part No: 260-23293: 3.49 dBi (Numeric gain: 2.23) Antenna Calculation for MIMO Mode: $\text{Total ANT}=10*\text{LOG}(((10^{(2.61/20)}+10^{(3.49/20)})^2)/2)=6.07\text{dBi}$ (Numeric gain: 4.05)
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation* <input type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A

Remark:

The maximum output power is 19.91dBm (97.9490mW) at 2442MHz (with 2.23 numeric antenna gain.)

TEST RESULTS

No non-compliance noted.

MPE EVALUATION

No non-compliance noted.

**Calculation**

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

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

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770d^2}$$

Changing to units of mW and cm, using:

$$P (mW) = P (W) / 1000 \text{ and}$$

$$d (cm) = d(m) / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

Maximum Permissible Exposure

Substituting the MPE safe distance using $d = 20$ cm into Equation 1:

Yields

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

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²



IEEE 802.11b mode:

EUT output power = 97.9490mW

Numeric Antenna gain = 2.23

→ Power density = 0.04347 mW / cm²

IEEE 802.11g mode:

EUT output power = 162.5549 mW

Numeric Antenna gain = 2.23

→ Power density = 0.072137 mW / cm²

IEEE 802.11n HT 20 MHz mode:

EUT output power = 156.6751 mW

Numeric Antenna gain = 4.05

→ Power density = 0.12627mW / cm²

IEEE 802.11n HT 40 MHz mode:

EUT output power = 158.8547 mW

Numeric Antenna gain = 4.05

→ Power density = 0.12803 mW / cm²

(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.)