



APPENDIX I RADIO FREQUENCY EXPOSURE

LIMIT

According to §15.407(f), U-NII devices are subject to the radio frequency radiation exposure requirements specified in §§ 1.1307(b), 2.1091 and 2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

EUT Specification

EUT	802.11a/b/g/n access point
Frequency band (Operating)	<input type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input checked="" type="checkbox"/> WLAN: 5.15GHz ~ 5.25GHz <input checked="" type="checkbox"/> WLAN: 5.25GHz ~ 5.35GHz <input checked="" type="checkbox"/> WLAN: 5.470GHz ~ 5.725GHz <input type="checkbox"/> Bluetooth: 2.402 GHz ~ 2.482 GHz <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	General Population/Uncontrolled exposure ($S=1mW/cm^2$)
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 802.11a mode: 12.65dBm (18.41mW) draft 802.11n Standard-20 MHz Channel mode: 16.70 dBm (46.77mW) draft 802.11n Wide-40 MHz Channel mode: 19.09 dBm (81.10mW)
Antenna gain (Max)	3 dBi (Numeric gain: 2.00) TOTAL ANTENNA GAIN=7.77dBi(Numeric gain: 5.98)
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation* <input type="checkbox"/> N/A
Remark:	
<ol style="list-style-type: none"> The maximum output power is 19.09 dBm (81.10mW) at <u>5270MHz</u> (with <u>5.98 numeric antenna gain</u>.) For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is $1.0 mW/cm^2$ even if the calculation indicates that the power density would be larger. 	



TEST RESULTS

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

IEEE 802.11a:

EUT output power = 18.41mW

Numeric Antenna gain = 5.98

→ Power density = 0.0219 mW / cm²



draft 802.11an Standard-20 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

EUT output power = 46.77mW

Numeric Antenna gain = 5.98

→ Power density = 0.0557mW / cm²

draft 802.11an Wide-40 MHz Channel mode / Chain 0+ Chain 1 +Chain 2

EUT output power =81.10mW

Numeric Antenna gain = 5.98

→ Power density = 0.0965 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.)