



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.

EUT Specification

EUT	802.11a/b/g/n access point
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 checked="" 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 = 5mW/cm ²) <input checked="" type="checkbox"/> 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 802.11b mode: 16.22dBm (41.88mW) IEEE 802.11g mode: 14.54dBm (28.44mW) draft 802.11gn Standard-20 MHz Channel mode: 18.07 dBm (64.12mW) draft 802.11gn Wide-40 MHz Channel mode: 16.85 dBm (48.42mW) IEEE 802.11a mode: 14.82dBm (30.34 mW) draft 802.11an Standard-20 MHz Channel mode:17.28 dBm(53.46mW) draft 802.11an Wide-40 MHz Channel mode: 16.54 dBm (45.08mW)
Antenna gain (Max)	Two Puck antennas for 2.4GHz Gain 2.34 dBi and 2.89 dBi /Total gain 5.63 dBi and two Puck antennas for 5 GHz Gain 1.63 dBi and -0.78dBi /Total gain 3.60 dBi
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation* <input type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A

Remark:

1. The maximum output power is 18.07dBm (64.12mW) at 2462MHz (with 3.66numeric antenna gain.);
17.82dBm (53.46mW) at 5745MHz (with 2.29numeric antenna gain.)
2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.
4. Total gain (dBm) = 10*LOG(10^{^(Chain 0 gain / 10)}+10^{^(Chain 1 gain / 10)})



TEST RESULTS

No non-compliance noted.

Calculation

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

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:

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

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

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

1)IEEE 802.11b:

EUT output power = 41.88mW

Numeric Antenna gain = 1.95

→ Power density = 0.0163 mW / cm²



IEEE 802.11g:

EUT output power = 28.44mW

Numeric Antenna gain = 1.95

→ Power density = 0.0110 mW / cm²

draft 802.11gn Standard-20 MHz Channel mode

EUT output power = 64.12mW

Numeric Antenna gain = 3.66

→ Power density = 0.0467 mW / cm²

draft 802.11gn Wide-40 MHz Channel mode

EUT output power = 48.42mW

Numeric Antenna gain = 3.66

→ Power density = 0.0352 mW / cm²

IEEE 802.11a:

EUT output power = 30.33mW

Numeric Antenna gain = 1.46

→ Power density = 0.0088 mW / cm²

draft 802.11an Standard-20 MHz Channel mode

EUT output power =53.46mW

Numeric Antenna gain = 2.29

→ Power density = 0.0244 mW / cm²

draft 802.11an Wide-40 MHz Channel mode

EUT output power = 45.08mW

Numeric Antenna gain = 2.29

→ Power density = 0.0205 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.)



2)Bluetooth + WIFI

Bluetooth highest MPE:

EUT output power = 1.318mW

Numeric Antenna gain = 1.945

→ Power density = 0.00051 mW / cm²

WIFI highest MPE:

draft 802.11gn Standard-20 MHz Channel mode

EUT output power = 64.12mW

Numeric Antenna gain = 3.66

→ Power density = 0.0467 mW / cm²

Total : → Power density = 0.04721 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.)