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	802.11 bgn Enterprise Access point with plastic shell and internal antenna
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.24GHz ☐ WLAN: 5.745GHz ~ 5.825GHz ☐ Others
Device category	☐ Portable (<20cm separation) ☐ Mobile (>20cm separation) ☒ Others
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm^2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Max. output power	IEEE 802.11b: 18.83dBm (76.38mW) IEEE 802.11g: 16.55dBm (45.19mW) draft 802.11n Standard-20 MHz Channel mode: 17.11dBm (51.42mW) draft 802.11n Wide-40 MHz Channel mode: 16.74dBm (47.25mW)
Antenna gain (Max)	Two PIFA antennas for 2.4GHz Gain 3.0 dBi /Total gain 6.01 dBi
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation ☐ N/A

Remark:

1. *The maximum output power is 18.08dBm (64.27mW) at 2412MHz (with 2.00numeric 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

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:

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

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

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

Where *d = Distance in cm*
P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm^2

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 / cm^2

1)IEEE 802.11b:

EUT output power = 76.38mW

Numeric Antenna gain = 2.00

→ Power density = 0.0304 mW / cm^2

IEEE 802.11g:

EUT output power = 45.19mW

Numeric Antenna gain = 2.00

→ Power density = 0.0180 mW / cm^2

draft 802.11gn Standard-20 MHz Channel mode

EUT output power = 51.42mW

Numeric Antenna gain = 3.99

→ Power density = 0.0408 mW / cm^2

draft 802.11gn Wide-40 MHz Channel mode

EUT output power = 47.25mW

Numeric Antenna gain = 3.99

→ Power density = 0.0375 mW / cm^2

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.)