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

<table>
<tr><td>EUT</td><td>802.11a/b/g/n access point</td></tr>
<tr><td>Frequency band (Operating)</td><td>☒ WLAN: 2.412GHz ~ 2.462GHz
☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz
☒ WLAN: 5.745GHz ~ 5.825GHz
☐ Others</td></tr>
<tr><td>Device category</td><td>☐ Portable (<20cm separation)
☒ Mobile (>20cm separation)
☐ Others</td></tr>
<tr><td>Exposure classification</td><td>☐ Occupational/Controlled exposure (S = 5mW/cm^2)
☒ General Population/Uncontrolled exposure (S=1mW/cm^2)</td></tr>
<tr><td>Antenna diversity</td><td>☐ Single antenna
☒ Multiple antennas
☐ Tx diversity
☐ Rx diversity
☒ Tx/Rx diversity</td></tr>
<tr><td>Max. output power</td><td>IEEE 802.11b mode: 25.38dBm (345.14mW)
IEEE 802.11g mode: 24.58dBm (287.08mW)
802.11gn Standard-20 MHz Channel mode: 26.98 dBm (489.96mW)
802.11gn Wide-40 MHz Channel mode: 27.43 dBm (552.85mW)
IEEE 802.11a mode: 21.12dBm (129.42 mW)
802.11an Standard-20 MHz Channel mode:23.92 dBm(246.42mW)
802.11an Wide-40 MHz Channel mode: 25.11 dBm (323.99mW)
(the EUT transmitting and receiving with two antennas simultaneously working at n mode)</td></tr>
<tr><td>Antenna gain (Max)</td><td>
<table>
<tr><td>Mode</td><td>gian</td><td>TX function</td><td>numeric antenna gian</td></tr>
<tr><td>802.11a</td><td>2dBi</td><td>1TX</td><td>1.58</td></tr>
<tr><td>802.11b</td><td>2dBi</td><td>1TX</td><td>1.58</td></tr>
<tr><td>802.11g</td><td>2dBi</td><td>1TX</td><td>1.58</td></tr>
<tr><td>802.11n(20MHz)</td><td>5.1 dBi</td><td>2TX</td><td>3.23</td></tr>
<tr><td>802.11n(40MHz)</td><td>5.1 dBi</td><td>2TX</td><td>3.23</td></tr>
</table>
</td></tr>
<tr><td>Evaluation applied</td><td>☒ MPE Evaluation*
☐ SAR Evaluation
☐ N/A</td></tr>
</table>

Remark:

1. *The maximum output power is 27.43dBm (552.85mW) at 2452MHz (with 3.23numeric antenna gain.); 25.11dBm (323.99mW) at 5795MHz (with 3.23numeric 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) = chain gian+10*log N from KDB 622911*

The EUT Incorporates a MIMO function.Physically, the EUT Provides two completed transmitters and two Receivers

MODULATION MODE		TX FUNCTION
A	802.11b Mode	1TX
B	802.11g Mode	1TX
C	802.11a Mode	1TX
D	802.11n (20MHz) mode	2TX
E	802.11n (40MHz) mode	2TX

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 = 345.14mW

Numeric Antenna gain = 1.58

→ Power density = 0.109 mW / cm^2

IEEE 802.11g:

EUT output power = 287.08mW

Numeric Antenna gain = 1.58

→ *Power density = 0.090 mW / cm^2*

802.11n Standard-20 MHz Channel mode

EUT output power =489.96mW

Numeric Antenna gain = 3.23

→ *Power density = 0.314 mW / cm^2*

802.11n Wide-40 MHz Channel mode

EUT output power = 552.85mW

Numeric Antenna gain = 3.23

→ *Power density = 0.355 mW / cm^2*

IEEE 802.11a:

EUT output power = 129.42mW

Numeric Antenna gain = 1.58

→ *Power density = 0.040 mW / cm^2*

802.11n Standard-20 MHz Channel mode

EUT output power =246.42mW

Numeric Antenna gain = 3.23

→ *Power density = 0.158 mW / cm^2*

802.11n Wide-40 MHz Channel mode

EUT output power = 323.99mW

Numeric Antenna gain = 3.23

→ *Power density = 0.208 mW / cm^2*

2.4 and 5.8GHz radio can transmit at the same time

→ *MAX Power density= 0.355 mW / cm2 + 0.208 mW / cm2=0.563 mW / cm^2*

evaluation when both radio are transmitting

The AP25N01 supports 3 different operation modes: Access Point, Client Bridge, and Client Router.2.4G and 5G wireless is separate. Each radio can be used in Access Point or Client Bridge or Client Router.Access Point or Client Bridge mode can be worked in 5G and 2.4G at the same time.

(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.)