RF Exposure Requirements: **§1.1307(b)(1) and §1.1307(b)(2):** 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.

RF Radiation Exposure Limit: **§1.1310:** As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

Senao NMP-8602+ module

2.4GHz DTS w/ 9dBi antenna

EUT's operating frequencies @ 2400-2483.5 MHz; highest conducted power =*24.66dBm,* therefore, **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2**

Gain of Omni Antenna @ 2.4GHz= 9 dBi

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

where, S = Power Density (1 mW/cm^2)
P = Power Input to antenna (292.42 mW)
G = Numeric Antenna Gain (7.94)
R = Safe Distance (cm)

$R = \sqrt{((292.42*7.94)/(4*\pi*1))} = 13.6$ cm

UNII2 w/ 9 dBi antenna

EUT's operating frequencies @ 5250-5725 MHz; highest conducted power = *17.66dBm*, therefore, **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2**

Gain of Omni Antenna @ 5GHz= 9 dBi

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

where, S = Power Density (mW/cm^2)
P = Power Input to antenna (58.34 mW)
G = Numeric Antenna Gain (7.94)
R = Safe Distance (20 cm)

$R = \sqrt{((58.34*7.94)/(4*\pi*1))} = 6.07$ cm

UNII3 w/ 9dBi antenna

EUT's operating frequencies @ 5725-5825 MHz; highest conducted power = *14.15dBm*, therefore, **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2**

Gain of Omni Antenna @ 5GHz= 9 dBi

Equation from page 18 of OET 65, Edition 97-01

$S = PG / 4\pi R^2$ or $R = \sqrt{PG / 4\pi S}$

where, S = Power Density (mW/cm^2)
P = Power Input to antenna (26.00 mW)
G = Numeric Antenna Gain (7.94)
R = Safe Distance (20 cm)

$R = \sqrt{((26.00*7.94)/(4*\pi*1))} = 4.06$ cm

UNII3 w/ 26 dBi antenna

EUT's operating frequencies @ 5725-5825 MHz; highest conducted power = *14.15dBm*, therefore, **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2**

Gain of Dish Antenna @ 5GHz= 26 dBi

Equation from page 18 of OET 65, Edition 97-01

$S = PG / 4\pi R^2$ or $R = \sqrt{PG / 4\pi S}$

where, S = Power Density (mW/cm^2)
P = Power Input to antenna (26.00 mW)
G = Numeric Antenna Gain (398.11)
R = Safe Distance (20 cm)

$R = \sqrt{((26.00*398.11)/(4*\pi*1))} = 28.71$ cm

Ubiquiti XR5

UNII2 w/ 9 dBi antenna

EUT's operating frequencies @ 5250-5725 MHz; highest conducted power = *14.76dBm*, therefore, **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2**

Gain of Omni Antenna @ 5GHz= 9 dBi

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

where, S = Power Density (1 mW/cm^2)
P = Power Input to antenna (29.92 mW)
G = Numeric Antenna Gain (7.94)
R = Safe Distance (cm)

$R = \sqrt{((29.92*7.94)/(4*\pi*1))} = 4.35$ cm

5.8GHz DTS w/ 9 dBi antenna

EUT's operating frequencies @ 5725-5825 MHz; highest conducted power = *20.10dBm,* therefore, **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2**

Gain of Omni Antenna @ 5GHz= 9 dBi

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

where, S = Power Density (1 mW/cm^2)
P = Power Input to antenna (102.33 mW)
G = Numeric Antenna Gain (7.94)
R = Radius (cm)

$R = \sqrt{((102.33*7.94)/(4*\pi*1))} = 8.04$ cm

Separation Distance with Co-Located Modules

Senao	Ubiquiti	UNII2 w/ 9 dBi	5.8GHz DTS w/ 9 dBI
2.4GHz DTS w/ 9dBi		14.28 cm	
UNII2 w/ 9dBi		7.47 cm	
UNII3 w/ 9dBI		5.95 cm	
UNII3 w/ 26dBi		29.04 cm	

Separation Distance = $R = \sqrt{(P_1G_1+P_2G_2)/(4\pi S)}$

Where, P_1 = Power Input to Antenna Port 1 (mW)

G_1 = Numeric Gain of Antenna 1

P_2 = Power Input to Antenna Port 2 (mW)

G_2 = Numeric Gain of Antenna 2

S = Power Density (1 mW/cm^2)

R = Minimum Safe Distance (cm)

Senao 2.4GHz DTS w/ 9dBi antenna & Ubiquiti UNII2 w/ 9 dBi antenna

$R = \sqrt{((P_1G_1+P_2G_2)/(4\pi S))} = \sqrt{((292.42*7.94+29.92*7.94)/(4*\pi*1))} = 14.28$ cm

Senao UNII2 w/ 9dBi antenna & Ubiquiti UNII2 w/ 9 dBi antenna

$R = \sqrt{((P_1G_1+P_2G_2)/(4\pi S))} = \sqrt{((58.34*7.94+29.92*7.94)/\ )/(4*\pi*1))} = 7.47$ cm

Senao UNII3 w/ 9dBi antenna & Ubiquiti UNII2 w/ 9dBi antenna

$R = \sqrt{((P_1G_1+P_2G_2)/(4\pi S))} = \sqrt{((26.00*7.94+29.92*7.94)/(4*\pi*1))} = 5.95$ cm

Senao UNII3 w/ 26dBi antenna & Ubiquiti UNII2 w/ 9dBi antenna

$R = \sqrt{((P_1G_1+P_2G_2)/(4\pi S))} = \sqrt{((26.00*398.11+29.92*7.94)/(4*\pi*1))} = 29.04$ cm

Senao 2.4GHz DTS w/ 9dBi antenna & Ubiquiti 5.8GHz DTS w/ 9dBI antenna

$R = \sqrt{((P_1G_1+P_2G_2)/(4\pi S))} = \sqrt{((292.42*7.94+102.33*7.94)/(4*\pi*1))} = 15.80$ cm

Senao UNII2 w/ 9dBi antenna & Ubiquiti 5.8GHz DTS w/ 9dBi antenna

$R = \sqrt{((P_1G_1+P_2G_2)/(4\pi S))} = \sqrt{((58.34*7.94+102.33*7.94)/(4*\pi*1))} = 10.08$ cm

Senao UNII3 w/ 9dBi antenna & Ubiquiti 5.8GHz DTS w/ 9dBi antenna

$R = \sqrt{((P_1G_1+P_2G_2)/(4\pi S))} = \sqrt{((26.00*7.94+102.33*7.94)/(4*\pi*1))} = 9.01$ cm

Senao UNII3 w/ 26dBi antenna & Ubiquiti 5.8GHz DTS w/ 9dBi antenna

$R = \sqrt{((P_1G_1+P_2G_2)/(4\pi S))} = \sqrt{((26.00*398.11+102.33*7.94)/(4*\pi*1))} = 29.81$ cm

NOTE TO TECH WRITER – Copy and paste MPE Calculation from Tech Engineer in highlighted area. Remove this section if no RF Calculation is required, or if a SAR Report or MPE Report is issued.