

MPE Calculations(WIMAX - OBW: 5MHz)

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user. The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

$EIRP = P + G$ $EIRP = 24.05Bm + 3.34 \text{ dBi}$ $EIRP = 27.39dBm$	Where, P = Power input to the antenna (mW) G = Power gain of the antenna (dBi)
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Power density at the specific separation:

$S = PG / (4R^2 \pi)$ $S = (254.10 * 2.16) / (4 * 20^2 * \pi)$ <u>$S = 0.109 \text{ mW/cm}^2$</u>	Where, S = Maximum power density (mW/cm^2) P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna(20cm)
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Conclusion:

The maximum permissible exposure (MPE) of the general Population/Uncontrolled for this device is 1.0 mW/cm^2 . The calculated power density at 20cm (0.109 mW/cm^2) does not exceed the 1.0 mW/cm^2 .

Therefore, the exposure condition of the EUT is compliant with FCC rules.

MPE Calculations(WIMAX - OBW: 10MHz)

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user. The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

$\text{EIRP} = P + G$ $\text{EIRP} = 24.20\text{Bm} + 3.34 \text{ dBi}$ $\text{EIRP} = 27.54\text{dBm}$	<p>Where,</p> <p>P = Power input to the antenna (mW)</p> <p>G = Power gain of the antenna (dBi)</p>
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Power density at the specific separation:

$S = PG/(4R^2 \pi)$ $S = (263.03 * 2.16) / (4 * 20^2 * \pi)$ $\underline{\underline{S = 0.113 \text{ mW/cm}^2}}$	<p>Where,</p> <p>S = Maximum power density (mW/cm²)</p> <p>P = Power input to the antenna (mW)</p> <p>G = Numeric power gain of the antenna</p> <p>R = Distance to the center of the radiation of the antenna(20cm)</p>
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Conclusion:

The maximum permissible exposure (MPE) of the general Population/Uncontrolled for this device is **1.0 mW/cm²** . The calculated power density at 20cm (**0.113 mW/cm²**) does not exceed the **1.0 mW/cm²**.

Therefore, the exposure condition of the EUT is compliant with FCC rules.

MPE Calculations(802.11b)

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user. The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

$EIRP = P + G$ $EIRP = 8.48Bm + 2.56 \text{ dBi}$ $EIRP = 11.04dBm$	Where, P = Power input to the antenna (mW) G = Power gain of the antenna (dBi)
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Power density at the specific separation:

$S = PG / (4R^2 \pi)$ $S = (7.047 * 1.803) / (4 * 20^2 * \pi)$ <u>$S = 0.003 \text{ mW/cm}^2$</u>	Where, S = Maximum power density (mW/cm^2) P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna(20cm)
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Conclusion:

The maximum permissible exposure (MPE) of the general Population/Uncontrolled for this device is 1.0 mW/cm^2 . The calculated power density at 20cm (0.109 mW/cm^2) does not exceed the 1.0 mW/cm^2 .

Therefore, the exposure condition of the EUT is compliant with FCC rules.

MPE Calculations(802.11g)

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user. The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

$\text{EIRP} = P + G$ $\text{EIRP} = 8.49\text{Bm} + 2.56 \text{ dBi}$ $\text{EIRP} = 11.05\text{dBm}$	<p>Where,</p> <p>P = Power input to the antenna (mW)</p> <p>G = Power gain of the antenna (dBi)</p>
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Power density at the specific separation:

$S = PG/(4R^2 \pi)$ $S = (7.063 * 1.803) / (4 * 20^2 * \pi)$ $\underline{\underline{S = 0.003 \text{ mW/cm}^2}}$	<p>Where,</p> <p>S = Maximum power density (mW/cm²)</p> <p>P = Power input to the antenna (mW)</p> <p>G = Numeric power gain of the antenna</p> <p>R = Distance to the center of the radiation of the antenna(20cm)</p>
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Conclusion:

The maximum permissible exposure (MPE) of the general Population/Uncontrolled for this device is **1.0 mW/cm²** . The calculated power density at 20cm (**0.113 mW/cm²**) does not exceed the **1.0 mW/cm²**.

Therefore, the exposure condition of the EUT is compliant with FCC rules.

Conclusion for simultaneous transmission

Both of the WIMAX and WLAN can transmit simultaneously, the formula of calculated the MPE is :

$$CPD_1 / LPD_1 + CPD_2 / LPD_2 + CPD_3 / LPD_3 + \dots < 1 \text{ mW/cm}^2$$

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst case calculation is $0.113 / 1 + 0.003 / 1 = 0.116$, which is less than the limit(1mW/cm²).

This confirmed that the device comply with FCC 1.1310 ME limit.