

RF Exposure / MPE Calculation

No. : 13671144H
Applicant : Sony Interactive Entertainment Inc.
Type of Equipment : Wireless communication module
Model No. : AW-XM501
FCC ID : AK8M20DAL1

Sony Interactive Entertainment Inc. declares that Model: AW-XM501 complies with FCC radiation exposure requirement specified in the FCC Rule 2.1091 (for mobile).

RF Exposure Calculations:

The following information provides the minimum separation distance for the highest gain antenna provided with the "AW-XM501" as calculated from (B) Limits for General Population / Uncontrolled Exposure of TABLE 1- LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE) of §1.1310 Radiofrequency radiation exposure limits.

[WLAN 2.4 GHz band part]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm² uncontrolled exposure limit. The Friis formula used was:

$$S = \frac{P \times G}{4 \times \pi \times r^2}$$

Where

$P =$ 14.23 mW (Maximum average output power)

☐ Time average was used for the above value in consideration of 6-minutes time-averaging

☒ Burst power average was used for the above value in consideration of worst condition.

$G =$ 4.742 Numerical Antenna gain; equal to 6.76dBi

$r =$ 20 cm (Separation distance)

Power Density Result $S = 0.01343 \text{ mW/cm}^2$

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

[WLAN 5 GHz band part]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm² uncontrolled exposure limit. The Friis formula used was:

$$S = \frac{P \times G}{4 \times \pi \times r^2}$$

Where

$P =$ 15.06 mW (Maximum average output power)

☐ Time average was used for the above value in consideration of 6-minutes time-averaging

☒ Burst power average was used for the above value in consideration of worst condition.

$G =$ 6.745 Numerical Antenna gain; equal to 8.29dBi

$r =$ 20 cm (Separation distance)

Power Density Result $S = 0.02021 \text{ mW/cm}^2$

[Bluetooth part (BT1)]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm² uncontrolled exposure limit. The Friis formula used was:

$$S = \frac{P \times G}{4 \times \pi \times r^2}$$

Where

$P =$ 1.22 mW (Maximum average output power)

☒ Time average was used for the above value in consideration of 6-minutes time-averaging

☐ Burst power average was used for the above value in consideration of worst condition.

$G =$ 3.802 Numerical Antenna gain; equal to 5.8dBi

$r =$ 20 cm (Separation distance)

Power Density Result $S = 0.00092 \text{ mW/cm}^2$

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[Bluetooth part (BT2)]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm² uncontrolled exposure limit. The Friis formula used was:

$$S = \frac{P \times G}{4 \times \pi \times r^2}$$

Where

$P =$ 1.34 mW (Maximum average output power)

☐ Time average was used for the above value in consideration of 6-minutes time-averaging

☒ Burst power average was used for the above value in consideration of worst condition.

$G =$ 3.802 Numerical Antenna gain; equal to 5.8dBi

$r =$ 20 cm (Separation distance)

$$\text{Power Density Result } S = 0.00101 \text{ mW/cm}^2$$

Therefore, if WLAN 2.4 GHz, Bluetooth (BR/EDR/LE) (BT1) and Bluetooth (BR/EDR/LE) (BT2) transmit simultaneously,

$$\begin{aligned} S &= 0.01343 \text{ mW/cm}^2 + 0.00092 \text{ mW/cm}^2 + 0.00101 \text{ mW/cm}^2 \\ &= 0.01536 \text{ mW/cm}^2 \end{aligned}$$

Therefore, if WLAN 5 GHz, Bluetooth (BR/EDR/LE) (BT1) and Bluetooth (BR/EDR/LE) (BT2) transmit simultaneously,

$$\begin{aligned} S &= 0.02021 \text{ mW/cm}^2 + 0.00092 \text{ mW/cm}^2 + 0.00101 \text{ mW/cm}^2 \\ &= 0.02214 \text{ mW/cm}^2 \end{aligned}$$

Even taking into account the tolerance, this device can be satisfied with the limits.

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