RF Exposure / MPE Calculation

No.	:	11155194H
Applicant	:	Sony Interactive Entertainment Inc.
Type of Equipment	:	Wireless communication module
Model No.	:	J20H091
		*WLAN (2.4GHz), Bluetooth Low Energy parts
FCC ID	:	AK8M16DFL1

Sony Interactive Entertainment Inc. declares that Model: J20H091 complies with FCC radiation exposure requirement specified in the FCC Rule 2.1091 (for mobile).

RF Exposure Calculations:

[WLAN (2.4 GHz) part]
The following information provides the minimum separation distance for the highest gain antenna provided with the "J20H091" 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.

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm^2 uncontrolled exposure limit. The Friis formula used was:

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

Where

P = 19.35 mW (Maximum average output power)

☑ Frame power was used for the above value in consideration of 6-minutes time-averaging

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

G = 7.261 Numerical Antenna gain; equal to 8.61dBi

r = 20 cm (Separation distance)

Power Density Result S = **0.02795 mW/cm^2**

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[Bluetooth Low Energy part]

The following information provides the minimum separation distance for the highest gain antenna provided with the "J20H091" 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.

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm^2 uncontrolled exposure limit. The Friis formula used was:

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

Where

P = 0.99 mW (Maximum average output power)

☑ Frame power was used for the above value in consideration of 6-minutes time-averaging

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

G = 4.365 Numerical Antenna gain; equal to 6.4dBi

r = 20 cm (Separation distance)

Power Density Result S = **0.00086 mW/cm^2**

Reference:

[Bluetooth part]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm^2 uncontrolled exposure limit. The Friis formula used was:

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

Where

P = 1.33 mW (Maximum average output power)

☑ Frame power was used for the above value in consideration of 6-minutes time-averaging

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

G = 4.365 Numerical Antenna gain; equal to 6.4 dBi

r = 20 cm (Separation distance)

Power Density Result S = **0.00115 mW/cm^2**

Reference:

[WLAN (5 GHz) part]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm^2 uncontrolled exposure limit. The Friis formula used was:

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

Where

P = 15.42 mW (Maximum average output power)

☑ Frame power was used for the above value in consideration of 6-minutes time-averaging

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

G = 5.358 Numerical Antenna gain; equal to 7.29dBi

r = 20 cm (Separation distance)

Power Density Result S = **0.01644 mW/cm^2**

Therefore, if WLAN 2.4GHz and Bluetooth Low Energy transmit simultaneously,

S=0.02795 mW/cm^2 + 0.00086 mW/cm^2

=0.02881 mW/cm^2

Therefore, if WLAN 2.4GHz and Bluetooth transmit simultaneously,

S=0.02795 mW/cm^2 + 0.00115 mW/cm^2

=0.0291 mW/cm^2

Therefore, if Bluetooth Low Energy and WLAN 5GHz transmit simultaneously,

S=0.00086 mW/cm^2 + 0.01644mW/cm^2

=0.0173 mW/cm^2

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