RF Exposure / MPE Calculation

No.	:	12608632H-B
Applicant	:	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS
Type of Equipment	:	Display Audio
Model No.	:	R1 LOW
FCC ID	:	UJHR1LOW
		* Bluetooth part

MITSUBISHI ELECTRIC CORPORATION SANDA WORKS declares that Model: R1 LOW 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 "R1 LOW" 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

$P =$ 0.55 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.

$G =$ 1.449 Numerical Antenna gain; equal to 1.61 dBi

$r =$ 20 cm (Separation distance)

Power Density Result $S =$ **0.00016 mW/cm^2**

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

Reference:
[WLAN (2.4 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

$P =$ 16.69 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.

$G =$ 3.428 Numerical Antenna gain; equal to 5.35dBi

$r =$ 20 cm (Separation distance)

        Power Density Result $S =$ **0.01138 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

$P =$ 4.36 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.

$G =$ 3.690 Numerical Antenna gain; equal to 5.67 dBi

$r =$ 20 cm (Separation distance)

        Power Density Result $S =$ **0.00320 mW/cm^2**

Therefore, if Bluetooth and WLAN 2.4 GHz transmit simultaneously,
S=0.00016 mW/cm^2 + 0.01138 mW/cm^2
=0.01154 mW/cm^2

Therefore, if Bluetooth and WLAN 5 GHz transmit simultaneously,
S=0.00016 mW/cm^2 + 0.00320 mW/cm^2
=0.00336 mW/cm^2

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