

## RF Exposure / MPE Calculation

No. : 13329061H-R2  
Applicant : Pioneer Corporation  
Type of Equipment : Car Audio with Bluetooth / WLAN  
Model No. : SA211  
FCC ID : AJDK114

Pioneer Corporation declares that Model: SA211 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 "SA211" 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 part**

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

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

Where

$P =$  54.08 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.

$G =$  0.271 Numerical Antenna gain; equal to -5.67dBi

$r =$  20 cm (Separation distance)

**Power Density Result  $S = 0.00292 \text{ mW/cm}^2$**

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### **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<sup>2</sup> uncontrolled exposure limit. The Friis formula used was:

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

Where

$P =$  2.77 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.

$G =$  0.290 Numerical Antenna gain; equal to -5.38 dBi

$r =$  20 cm (Separation distance)

***Power Density Result*  $S = 0.00016 \text{ mW/cm}^2$**

Therefore, if WLAN and Bluetooth transmit simultaneously,

$$S = 0.00292 \text{ mW/cm}^2 + 0.00016 \text{ mW/cm}^2 = 0.00308 \text{ mW/cm}^2$$

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

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