RF Exposure / MPE Calculation

No.	14033198S
Customer	Panasonic Automotive Systems Co., Ltd.
Description of EUT	Car Navigation
Model Number of EUT	AT2107
FCC ID	ACJ932AT2107

Panasonic Automotive Systems Co., Ltd. declares that Model: AT2107 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 "AT2107" 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.

[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 = 3.29 mW (Maximum average output power)

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

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

G = 1.614 Numerical Antenna gain; equal to 2.08 dBi

r = 20 cm (Separation distance)

Power Density Result S = **0.00106 mW/cm^2**

[Bluetooth Low Energy 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 = 2.61 mW (Maximum average output power)

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

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

G = 1.614 Numerical Antenna gain; equal to 2.08 dBi

r = 20 cm (Separation distance)

Power Density Result S = **0.00084 mW/cm^2**

[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 1 mW/cm^2 uncontrolled exposure limit. The Friis formula used was:

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

Where

P = 17.50 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 = 2.535 Numerical Antenna gain; equal to 4.04 dBi

r = 20 cm (Separation distance)

Power Density Result S = **0.00883 mW/cm^2**

Therefore, if Bluetooth (BR/EDR) and WLAN (2.4 GHz band) transmit simultaneously,

S= 0.00106 mW/cm^2 + 0.00883 mW/cm^2

= 0.00989 mW/cm^2