RF Exposure / MPE Calculation

No.	15058381
Customer	ALPS ALPINE CO., LTD.
Description of EUT	Head unit
Model Number of EUT	AH00ICB 4
FCC ID	A269ZUA171

ALPS ALPINE CO., LTD. declares that Model: AH00ICB 4 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 “AH00ICB 4“ 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 = 1.81 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 = 0.955 Numerical Antenna gain; equal to -0.2 dBi

r = 20 cm (Separation distance)

***Power Density Result S =* 0.00034 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 = 2.37 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 = 0.955 Numerical Antenna gain; equal to -0.2 dBi

r = 20 cm (Separation distance)

***Power Density Result S =* 0.00045 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 = 23.55 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 = 0.836 Numerical Antenna gain; equal to -0.78 dBi

r = 20 cm (Separation distance)

Power Density Result S = **0.00391 mW/cm^2**

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

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

Where

P = 11.94 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 = 1.866 Numerical Antenna gain; equal to 2.71 dBi

r = 20 cm (Separation distance)

Power Density Result S = **0.00443 mW/cm^2**

Therefore, if WLAN (2.4 GHz band and 5 GHz band) and Bluetooth (BR/EDR) transmit simultaneously,

S= 0.00391 mW/cm^2 + 0.00443 mW/cm^2 + 0.00034 mW/cm^2

= 0.00868 mW/cm^2

Therefore, if WLAN (2.4 GHz band and 5 GHz band) and Bluetooth Low Energy transmit simultaneously,

S= 0.00391 mW/cm^2 + 0.00443 mW/cm^2 + 0.00045 mW/cm^2

= 0.00879 mW/cm^2