

RF Exposure / MPE Calculation

No. : 10607274H

Applicant : MITSUBISHI ELECTRIC CORPORATION SANDA WORKS
Type of Equipment : HEADUNIT A-HIGH
Model No. : NR-213
FCC ID : UJHNR213

MITSUBISHI ELECTRIC CORPORATION SANDA WORKS declares that Model : NR-213 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 "NR-213" 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 1.0mW/cm² uncontrolled exposure limit. The Friis formula used was:

$$S = (P * G) / (4 * \pi * r^2)$$

Where

P = 11.48 mW (Maximum average output power)
G = 2.14 Numerical Antenna gain; equal to 3.30 dBi
r = 20.0 cm

For: NR-213 (WLAN (2.4GHz band))

$$S = 0.00488 \text{ mW/cm}^2$$

$$S = (P * G) / (4 * \pi * r^2)$$

Where

P = 0.35 mW (Maximum average output power)
G = 1.71 Numerical Antenna gain; equal to 2.32 dBi
r = 20.0 cm

For: NR-213 (Bluetooth (2402-2480MHz))

$$S = 0.00012 \text{ mW/cm}^2$$

$$S = (P * G) / (4 * \pi * r^2)$$

Where

P = 1.53 mW (Maximum Conducted output power)
G = 4.47 Numerical Antenna gain; equal to 6.50 dBi
r = 20.0 cm

For: NR-213 (WLAN (5GHz band))

$$S = 0.00136 \text{ mW/cm}^2$$

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

$$S = 0.00488 \text{ mW/cm}^2 + 0.00012 \text{ mW/cm}^2 + 0.00136 \text{ mW/cm}^2 \\ = 0.00636 \text{ mW/cm}^2$$

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

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