

MPE Calculation - FCC ID: 2AZLW-OBDD-CON-V10

The FCC requires that the calculated MPE be equal to or less than a given limit dependent on frequency at a distance of 20 cm from a device to the body of a user.

The transmitter operation for the Remote OBD Vehicle Communication Interface (VCI) covers the 2.4GHz operating band.

Simultaneous transmission is not supported between any of the transmitters

The following FCC Rule Parts are applicable:

Part 1.1310 – Radiofrequency radiation exposure limits

Part 2.1091(c) – Radiofrequency radiation exposure evaluation: mobile devices

CALCULATION

The following far field power density equation is applicable:

$$S = \text{EIRP} / 4 \pi R^2$$

Where

S = Power density

EIRP = Effective Isotropically Radiated Power (EIRP = P x G)

P = Conducted Transmitter Power

G = Antenna Gain (relative to an isotropic radiator)

R = distance to the centre of radiation of the antenna (safe operating distance)

Calculation for 2.4GHz WLAN

Values:

Transmitter frequency range = 2412 - 2462MHz

P = 14.5 dBm

G = 0dBi (x 1.00)

EIRP = 14.5dBm (28.2mW)

R = 20cm

Power Density Requirement

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of
FCC Rule Part 1.1310 for 2.4GHz

$$S_{\text{req1}} = 1.0 \text{ mW/cm}^2$$

Calculation:

$$\begin{aligned} S &= \text{EIRP}/4 \pi R^2 \\ &= 28.2/(12.56 \times 20^2) \\ &= 28.2/(5024) \end{aligned}$$

$$S_1 = 0.006$$

(Equivalent to 1.5 cm safe operating distance)

Conclusion

The required 20cm RF exposure limits for General Population/ Uncontrolled Exposure FCC Rule Part 1.1310 limits will not be exceeded for the Remote OBD Vehicle Communication Interface (VCI) using antenna having a maximum gain of 0dBi.

Yours faithfully,



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