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To Whom It May Concern:

To investigate the RF exposure of the Tantalus Systems Corp. TC-1214 network interface card for a single phase watt-hour meter (FCC ID: OZFTC1214, IC ID: 3669A-TC1214) the FCC KDB publication 447498 and the Health Canada Safety Code 6 (as specified in RSS-102) have been used as guidelines to determine compliance with the FCC and IC RF exposure limit.

**Analysis per Health Canada Safety Code 6 guidelines:**

As per Health Canada Safety Code 6 guidelines:

The EUT is classed to meet the RF exposure that it subjects to the “General Population/Uncontrolled Environment”. Under this class the limit is calculated by:

$$S = f/1500$$

Where S is the Power Density in  $\text{mW}/\text{cm}^2$ .

F is the frequency of operation in MHz.

The EUT operates in the 902 to 928 MHz band, the lower exposure limit would be obtained by using a frequency at the lower edge of the band, therefore:

$$S = 902 / 1500 = 0.601 \text{ mW}/\text{cm}^2$$

The highest EIRP measured was 2.799W

However the maximum total transmit bandwidth available on a time averaged basis is only 10.9% of this number (this number is based on the worst case time of occupancy of 0.0436 seconds for a maximum of 0.4 seconds for the low data rate mode).

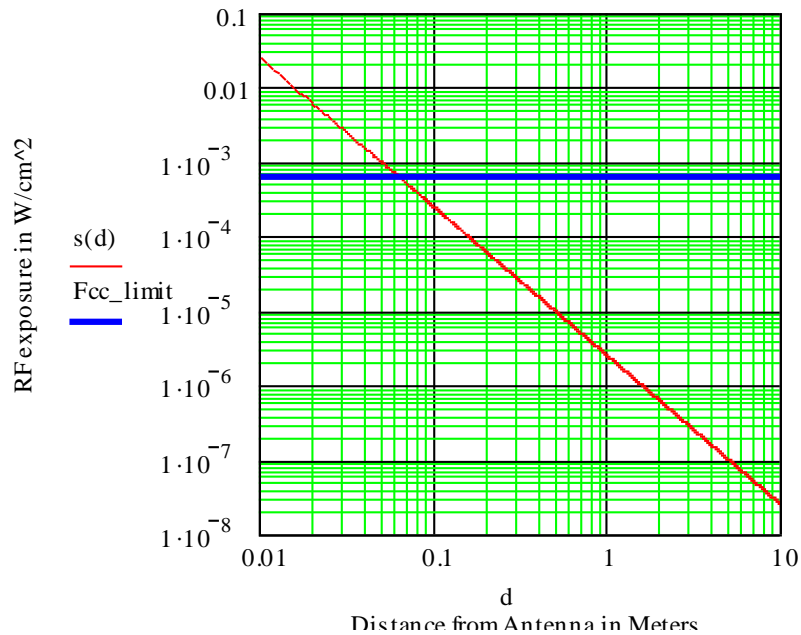
The average EIRP is therefore:

$$\begin{aligned} \text{EIRP}_{(\text{average})} &= \text{EIRP}_{(\text{continuous})} * \text{duty cycle} \\ \text{EIRP}_{(\text{average})} &= 2.799\text{W} * 0.109 = 305.1 \text{ mW} \end{aligned}$$

The predicted power density at a distance d, in the same horizontal plane as the elevation of the antenna is calculated and graphed below:

$$\begin{aligned} \text{Eirp} &:= 2.799 \quad \text{Duty\_cycle} := 0.109 \quad \text{Eirp\_avg} := \text{Eirp} * \text{Duty\_cycle} \quad \text{Freq\_Mhz} := 902 \\ d &:= 0.01, 0.011, \dots, 10 \quad (\text{Distance in meters}) \quad \text{Fcc\_limit} := \frac{\text{Freq\_Mhz}}{15001000} \quad (\text{Fcc Limit in W/cm}^2) \end{aligned}$$

$$s(d) := \frac{\text{Eirp\_avg}}{4 \cdot \pi \cdot (d \cdot 100)^2} \quad (\text{Power in W / cm}^2)$$



From the graph, it can be observed that the distance at which the RF exposure would exceed the limit would be approx. 6.5cm. The far field distance for a small antenna is given by any distance greater than  $\lambda/2\pi$ ; this equates to a minimum distance of 5.3cm, therefore this calculation is valid and so the minimum distance must be 6.5cm.

**Analysis as per the FCC KDB publication 447498:**

As per the FCC KDB publication 447498 D06 General RF Exposure Guidance, 4.3.1(b) states that SAR tests are not required if the RF power does not exceed the following formula:-

The maximum time averaged power (mW) must not exceed:-

$$\text{Max. Power (mW) Allowed at 50mm}^* + (\text{test separation distance} - 50 \text{ mm}) \times F_{(\text{MHz})}/150$$

$$*\text{Where Max. Power (mW) Allowed at 50mm} = 3 \times 50 / \sqrt{F_{(\text{GHz})}} = 155\text{mW}$$

In the previous analysis the maximum time averaged sourced based output power is 305.1mW. From the equation above, the separation distance required to ensure that the power does not exceed 305.1mW is 74.9mm

**Result:**

SAR tests are not required for this product. The RF power emitted by the module is considered not to be dangerous for the general public as long as a distance of 74.9mm is maintained during normal operation. However, since this product is for fixed applications a minimum distance of 20cm from the general public must be observed during normal operation.



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