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To Whom It May Concern:

To investigate the RF exposure of the Tantalus Systems Corp. SC-6X01 network interface card for a streetlight controller (FCC ID: OZFNICSC6X01, IC: 3669A-NICSC6X01) 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 mW/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:

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

The highest EIRP measured was 0.426W

However the maximum total transmit bandwidth available on a time averaged basis is only 9.5% of this number (this number is based on the worst case time of occupancy of 0.038 seconds for a maximum of 0.4 seconds for the low data rate mode).

The average EIRP is therefore:

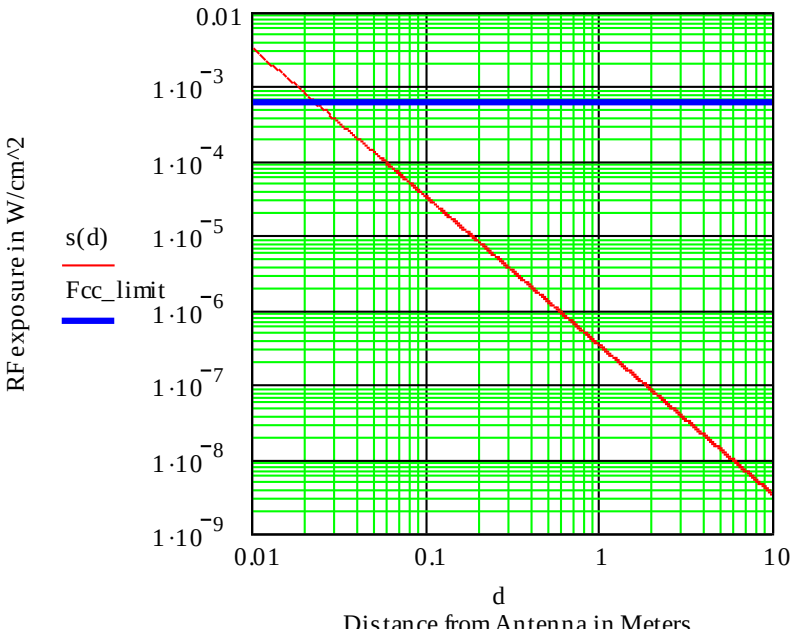
$EIRP_{(average)} = EIRP_{(continuous)} * \text{duty cycle}$
$EIRP_{(average)} = 0.426W * 0.095 = 40.5\ mW$

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

$Eirp := 0.426 \quad Duty\_cycle := 0.095 \quad Eirp\_avg := Eirp \cdot Duty\_cycle \quad Freq\_Mhz := 902$

$d := 0.01, 0.011 .. 10$ (Distance in meters) $\quad Fcc\_limit := \frac{Freq\_Mhz}{1500\,1000}$ (Fcc Limit in W/cm ^{2})

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



From the graph, it can be observed that the distance at which the RF exposure would exceed the limit would be approx. 2.5cm. 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 not valid so the minimum distance must be 5.3cm.

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:-

*Max. Power (mW) Allowed at 50mm** + (test separation distance–50 mm) *x* $F_{(MHz)}$/150

*Where *Max. Power (mW) Allowed at 50mm* = 3 *x* 50 /√ $F_{(GHz)}$ = 155mW

For fixed devices the minimum separation distance is 20cm, according to the formula the allowed maximum power is 1.058W. The maximum time averaged sourced based output power of this device is 40.1mW.

Result:

SAR tests are not required for this product. This device is used for fixed applications and the transmitter must be installed to provide a separation distance of at least 20cm from the general public during normal operation.

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