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To Whom It May Concern:

To investigate the RF exposure of the Tantalus Systems Corp. SC-5420 bridge modem (FCC ID: OZFSC5420) 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 0.355W

However the maximum total transmit bandwidth available on a time averaged basis is only 36.4% of this number (this number is based on the worst case time of occupancy of 0.1456 seconds for a maximum of 0.4 seconds for the high data rate mode).

The average EIRP is therefore:

$EIRP_{(average)} = EIRP_{(continuous)} * \text{duty cycle}$

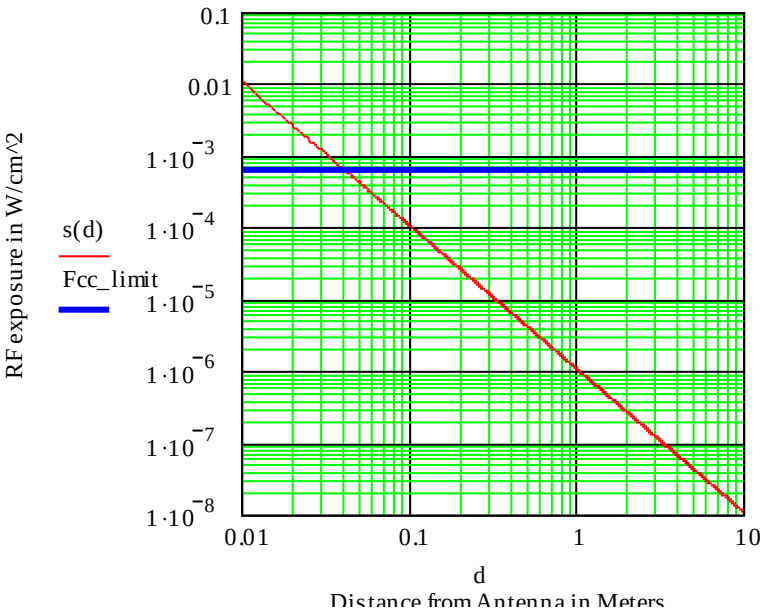
$EIRP_{(average)} = 0.355W * 0.364 = 0.129W$

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

$Eirp := 0.355 \quad Duty\_cycle := 0.364 \quad Eirp\_avg := Eirp \cdot Duty\_cycle \quad Freq\_Mhz := 902$

$d := 0.01, 0.011 .. 10$ (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. 4.2cm. 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 and so the minimum distance must be 5.3cm for which the calculation will become valid.

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

As in the previous analysis the maximum time averaged sourced based output power is 129mW. This value is less than the maximum power allowed at 5cm distance from the antenna.

As in the previous analysis this distance does not exceed the far field calculation and so the minimum distance must be 5.3cm. At this distance the maximum power allowed as per KDB 447498 is 174mW.

Result:

SAR tests are not required for this product and the antenna used for this transmitter must be installed to provide a separation distance of at least 5.3cm from the general public during normal operation.

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