

RF Exposure Calculations

As per OET Bulletin 65 – Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields – Edition 97-01 together with Supplement C (Ed. 01-01, June 2001) and Industry Canada RSS-102 (Issue 2, Nov. 2005), the maximum power density allowed for general population/uncontrolled exposure is $f/1500 \text{ mW/cm}^2 = f/150 \text{ W/m}^2$, where f is the frequency of operation in MHz. Calculating for the lowest frequency of operation (905MHz), the maximum power density allowed is $0.603 \text{ mW/cm}^2 = 6.03 \text{ W/m}^2$. The power density is calculated as follows:

$$S = (P \cdot G) / (4 \cdot \pi \cdot R^2) = \text{EIRP} / (4 \cdot \pi \cdot R^2)$$

where:

S = power density in mW/cm^2

P = power at the antenna connector in mW

G = linear system gain of the antenna

R = separation from antenna (cm)

EIRP = Effective Isotropic Radiated Power (mW).

By convention, a minimum separation distance of 20 cm has been used for indoor antennas. Applying this distance to the radiation exposure limits, the EIRP is limited to 3.03 W or 34.8 dBm. The min. separation distance required for an EIRP of 36 dBm or 4 W is 22.9 cm. At 30 cm, the EIRP could be as high as 38.3 dBm and still meet the max. power density requirement.

The 915C Radio Module has several antenna types that are intended to be fix mounted outdoors with a maximum radiated power of 36 dBm EIRP. These installations must be a min. of 30 cm. from people as per the 915C Radio Operational Requirements document.

The 915C Radio Module also has an indoor antenna with a gain of 4.4 dBi. With output power at the antenna connector of 26 dBm, this results in a max. radiated power of 30.4 dBm EIRP, which is significantly below the 34.8 dBm allowed at 20 cm. These installations must be a min. of 20 cm. from people as per the 915C Radio Operational Requirements document.

Therefore the FCC and IC requirements for human exposure to RF radiation are met.

The Industry Canada RF Technical Brief Cover Sheet is provided below.

Annex A – RF Technical Brief Cover Sheet

All Fields must be completed with the requested information or the following codes:

N/A – Not Applicable, N/P – Not Performed or N/V – Not Available

Where applicable, check appropriate box.

1. COMPANY NUMBER:	2943C
2. MODEL NUMBER:	915C
3. MANUFACTURER:	Vecima Networks Inc.
4. TYPE OF EVALUATION:	<p>Complete the applicable sections:</p> <p>(a) SAR Evaluation: Device Used in the Vicinity of the Human Head</p> <p>(b) SAR Evaluation: Body-worn Device</p> <p>(c) RF Evaluation</p> <p>Note: The worst-case scenario (i.e. highest measured value obtained) should be reported.</p>
	<p>(a) SAR Evaluation: Device Used in the Vicinity of the Human Head</p> <p>Multiple transmitters: Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Evaluated against exposure limits: General Public Use <input type="checkbox"/> Controlled Use <input type="checkbox"/></p> <p>Duty cycle used in evaluation: _____%</p> <p>Standard used for evaluation: _____</p> <p>SAR value: _____ W/kg Measured <input type="checkbox"/> Computed <input type="checkbox"/> Calculated <input type="checkbox"/></p>
	<p>(b) SAR Evaluation: Body-worn Device</p> <p>Multiple transmitters: Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Evaluated against exposure limits: General Public Use <input type="checkbox"/> Controlled Use <input type="checkbox"/></p> <p>Duty cycle used in evaluation: _____%</p> <p>Standard used for evaluation: _____</p> <p>SAR value: _____ W/kg Measured <input type="checkbox"/> Computed <input type="checkbox"/> Calculated <input type="checkbox"/></p>
	<p>(c) RF Evaluation</p> <p>Evaluated against exposure limits: General Public Use <input checked="" type="checkbox"/> Controlled Use <input type="checkbox"/></p> <p>Duty cycle used in evaluation: _____100_____%</p> <p>Standard used for evaluation: _____RF Exposure Evaluation_____</p> <p>Measurement distance: _____0.20_____m</p> <p>RF Value: _____6_____V/m <input type="checkbox"/> A/m <input type="checkbox"/> W/m² <input checked="" type="checkbox"/></p> <p>Measured <input type="checkbox"/> Computed <input type="checkbox"/> Calculated <input checked="" type="checkbox"/></p>

Annex B – Declaration of RF Exposure Compliance

ATTESTATION: I attest that the information provided in Annex A is correct; that a Technical Brief was prepared and the information it contains is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed and that the device meet the SAR and/or RF exposure limits of RSS-102

Signature: *Lawrence Gordon*

Date: 3 Sep 2008

NAME: (Please print or type): Lawrence A. Gordon

TITLE: (Please print or type): Senior Technical Design Lead

COMPANY: (Please print or type): Vecima Networks Inc.

