RF Exposure / SAR / Health Hazard Statement

Requirement:
According to USA CFR 15 §1.1307 (b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to radio frequency energy level in excess of the Commission's guideline. For Canada, RSS-102 Tests out the requirements and measurement techniques used to evaluate radio frequency (RF) exposure compliance of radiocommunication apparatus designed to be used within the vicinity of the human body.

SAR Testing Exclusion:
Per FCC 447498 General RF Exposure Guidance v05, Section 4.3.1, the 1-g (body) and 10-g (extremity) SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by the following formula

$$SAR = \frac{P_C}{d}\sqrt{f_{GHz}}$$

where d = minimum test distance and Pc is the source-based time-averaged maximum conducted output power, or EIRP for a device without a removable antenna.

For IC RSS-102, the SAR threshold is based on the higher of conducted output power and EIRP and is based on a power rating set for 1-g and 10-g SAR.

Exposure Duty Cycle:
The maximum power duty cycle was measured to be 2.058% as detailed in the EUT test report.

Thus, power (exposure) duty cycle is computed to be:

Power Duty Cycle = 10*Log10(0.02058) = -16.9 dB

This duty cycle is the worst case SOURCE-BASED TIME-AVERAGED duty cycle for this product.

Power Rating:
The chipset manufacturer's most recent datasheet states a maximum power rating for the chipset of 20 dBm, however the transmit power avaliable at the antenna report is 16.7 dBm after filter network and RF switch insertion losses. The worst case measured antenna gain for the EUT is 3.1 dBi, implying that the measured EIRP (19.9 dBm) is equivalent to the chipset power rating (20 dBm). EIRP is used in computing health hazard below. Average power rating is computed from the peak value and the power duty cycle detailed above.

SAR Threshold:
The SAR threshold at a minimum test distance of <5 mm are thus computed to be:

Test Date: 17-Feb-16
USA REF: 2.1091/1093, 447498 D01 General RF Exposure Guidance v06 **Test Engineer:** Joseph Brunett
IC REF: RSS-102 Issue 5 **EUT:** Nutek IVU – Large
Min. Sep. Distance: <5mm **EUT Mode:** Hopping
Meas. Distance: 3 meters

						Canada			USA		
Freq. MHz	Pout* Pk dBm	EIRP*** Pk dBm	Exposure Duty dB	Worst Case Po/EIRP(Avg)** dBm	mW	Calculated SAR Threshold (Avg) mW	1-g SAR Bo Power Threshold Exclusion Li mW	10-g SAR Extremity Pow Threshold Exclusion Lim mW	Calculated SAR Threshold (Avg)	1-g SAR Bo Power Threshold Exclusion Li	10-g SAR Extremity Powe Threshold Exclusion Limi
904.0	16.7	19.9	16.9	3.0	2.0	**2.0**	16.4	40.9	**.4**	3.0	7.5
914.0	16.5	19.4	16.9	2.5	1.8	**1.8**	16.3	40.6	**.3**	3.0	7.5
923.6	16.2	19.3	16.9	2.4	1.8	**1.8**	16.2	40.4	**.3**	3.0	7.5

*As Measured / Computed from highest fundamental emission, see fundamental emission section of this report.
**Only RMS level is required, RMS/6min << Pk, Peak emission employed to demonstrate compliance.

Thus the EUT meets the test exclusion thresholds for 1-g and 10-g SAR evaluation.