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**Attention: Reviewing Engineer**

RE: RF exposure information for the equipment Radio Link V410 (FCC ID: VDPRLV410JN2122)

**RF exposure information**

The device Radio Link V410 (FCC ID: VDPRLV410JN2122) is designed as module to be installed in a car. This device is to be used only for fixed and mobile applications.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all the persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure:

Frequency Range (MHz)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
300 – 1500	f/1500	30
1500 – 100.000	1.0	30

The equipment GE863-QUAD transmits in the following frequency ranges so that the applicable limits are:

Frequency range	Limit
1850.2 - 1909.8 MHz	1 mW/cm <sup>2</sup>
824.2 - 848.8 MHz	0.54 mW/cm <sup>2</sup>

The equipment is a GPRS Class 10, so that the maximum duty cycle is 2/8 = 1/4

Under conditions stated above MPE limits can be guaranteed as the calculation below shows:

**850 MHz frequency band**

Maximum output power: 0.554 W

Duty cycle: 1/4

Equivalent output power = Maximum output power x Duty cycle = 0.554 W x 1/4 = 0.1385 W = 138.5 mW

Using the equation:

$$S = P \cdot G / 4 \cdot \pi \cdot R^2$$

Where,

S = power density in mW/cm<sup>2</sup>

P = power input to the antenna in mW

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna in cm (20 cm Prediction distance)

$$S = 138.5 \text{ mW} / 4 \cdot \pi \cdot (20 \text{ cm})^2 = 0.0276 \text{ mW/cm}^2 < 0.54 \text{ mW/cm}^2 \text{ (limit)}$$

## **1900 MHz frequency band**

Maximum output power: 0.033 W

Duty cycle: 1/4

Equivalent output power = Maximum output power x Duty cycle = 0.033 W x 1/4 = 0.00825 W = 8.25 mW

Using the equation:

$$S = P \cdot G / 4 \cdot \pi \cdot R^2$$

Where,

S = power density in mW/cm<sup>2</sup>

P = power input to the antenna in mW

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna in cm (20 cm Prediction distance)

$$S = 8.25 \text{ mW} / 4 \cdot \pi \cdot (20 \text{ cm})^2 = 0.00164 \text{ mW/cm}^2 < 1 \text{ mW/cm}^2 \text{ (limit)}$$

**These predictions demonstrate that:**

The power density levels at a distance of 20 cm are below the maximum levels allowed by the FCC rules.

## **Conclusion:**

The equipment Radio Link V410 complies with the MPE limits if used with the provided antenna and this antenna is installed to provide a separation distance of at least 20 cm from all the persons.

## **Warning:**

To ensure the compliance with the MPE limits the antenna gain has been limited and a warning statement has been included in page 17.

Signed on behalf of Umndeni Circon (Pty) Ltd. by



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