technology that matters

Groenlo, 26 Augustus 2015

Declaration on radiation safety standard conformance

Return address: PO Box 6, 7140 AA Groenlo, The Netherlands

American Certification Body
Certification Department
6731 Whittier Avenue, Suite C110
McLean, Virginia 22101
USA

We, N.V. Nederlandsche Apparatenfabriek “Nedap”, declare that the following product:

Description	: Long-range vehicle and driver identification reader operating on 2.45 GHz, 433 MHz and 120 kHz. This calculation is for the 433 MHz part.
FCC ID	: CGDTRANSITULTI
Manufacturer	: N.V. Nederlandsche Apparatenfabriek “Nedap”
Brand	: Nedap
Model	: TRANSIT ULTIMATE

The measured field strength at 433 MHz is 82.84 dBµV/m @ 3 m distance.

$$E_{lim} = 20 \times \log_{10}\left(\frac{\sqrt{30P_{lim}}}{d}\right) + 120$$

Where:

E_{lim} = electric field strength limit, in dB (µV/m)
P_{lim} = EIRP limit, in watts
d = measurement distance, in meters

$$82.84 = 20 \log_{10}\left(\frac{\sqrt{30P_{lim}}}{3}\right) + 120 \text{ >>>> } -37.16 = 20 \log_{10}\left(\frac{\sqrt{30P_{lim}}}{3}\right) \text{ >>>>--} 1.858 = \log_{10}\left(\frac{\sqrt{30P_{lim}}}{3}\right)$$

$$0.014 = \frac{\sqrt{30P_{lim}}}{3} \gg\gg\gg Plim = 6\ \mu W$$

has a rated RF power of 6 µW, which means that the worst case prediction of power density (100% reflection) at 20 cm distance (worst case) can be calculated as follows:

$$S = \frac{EIRP}{4 * \pi * R^2}$$ (power density without reflection)

$$S = \frac{2^2 * EIRP}{4 * \pi * R^2}$$ (power density with 100% reflection)

$$S = \frac{2^2 * EIRP}{4 * \pi * R^2} = \frac{0.006mW}{\pi * (20cm)^2}$$ = 0.005 µW/cm² (Limit = 457 µW/cm²)

Yours Sincerely
N.V. Nederlandsche Apparatenfabriek "Nedap"

Jacques A.M. Hulshof
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