

Nokeval Oy, Rounionkatu 107, FI-37150 Nokia, Finland eGate-Kombi-LWUS-RHT-CO2-TVOC-Dust40-DP 2A3B4CMWX01
SGS Fimko Oy Karakaarenkuja 4, FI-02610 Espoo, Finland FINAS T004 8708A

REFERENCE DOCUMENTS

KDB447498 D04 Interim General RF Exposure Guidance v01 47 CFR §1.1310 Radiofrequency radiation exposure limits 47 CFR §2.1091 Radiofrequency radiation exposure evaluation: mobile devices Grant of the original module (FCC ID: VPYCMABZ)

EUT SPECIFICATION

The equipment under test is an indoor air quality transmitter, which measures temperature, humidity, CO2, TVOC, particles, and differential pressure. The equipment includes a LoRaWAN radio which operates in the 902-928 MHz band.

Operating Frequency Range:	125 kHz channel: 902.3-914.9 MHz
	500 kHz channel: 903.0-914.2 MHz
Channels:	125 kHz channel: 64
	500 kHz channel: 8
Nominal channel bandwidth:	125 kHz , 500 kHz
Channel separation:	125 kHz channel: 200 kHz
	500 kHz channel: 1.6 MHz
Maximum peak conducted output power	0.0746 W *)
Modulation:	LoRa
Integral Antenna gain:	+2.4 dBi
Device category:	Mobile (separation distance > 20 cm)
Environment:	General Population/Uncontrolled

*) referenced from the grant of the original module (FCC ID: VPYCMABZ)



ASSESSMENT

A single RF source is exempt if the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th} (\text{mW}) = \begin{cases} ERP_{20 \ cm} (d/20 \ \text{cm})^x & d \le 20 \ \text{cm} \\ \\ ERP_{20 \ cm} & 20 \ \text{cm} < d \le 40 \ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20} cm\sqrt{f}}\right)$$
 and f is in GHz;

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

With separation distance 20 cm and frequency 902.3 MHz, the exemption threshold P_{th} is 1841 mW. The effective radiated power of the EUT (79.0 mW) is below the exemption threshold.

Note: the EUT complies with the exemption threshold at distances \geq 2.33 cm.

CONCLUSION

The assessment shows that the device qualifies for SAR-based exemption in mobile use.

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