eurofins | Product Service

# RF-EXPOSURE ASSESSMENT REPORT

**FCC 47 CFR Part 2.1093**
**Industry Canada RSS-102**

**RF-Exposure evaluation of portable equipment**

| | |
|---|---|
| **Report Reference No**. ..... : | G0M-1902-8075-TFC093PE-V01 |
| **Testing Laboratory** ..... : | Eurofins Product Service GmbH |
| Address ..... : | Storkower Str. 38c<br>15526 Reichenwalde<br>Germany |
| Accreditation ..... : | FCC Test Firm Designation Number: DE0008<br>ISED Testing Laboratory site: 3470A-2 |
| **Applicant's name** ..... : | Piavita AG |
| Address ..... : | Technoparkstrasse 1<br>8005 Zurich<br>SWITZERLAND |
| **Test specification:** | |
| Standard..... : | 47 CFR 2.1093<br>KDB 447498 D01 v06:2015-10-23<br>RSS-102, Issue 5:2015-03 |
| **Equipment under test (EUT):** | |
| Product description | Equine vital signs wireless monitoring device |
| Model No. | Piavita Measuring device |
| Additional Model(s) | None |
| Brand Name(s) | None |
| Hardware version | V04 |
| Firmware / Software version | 2 |
| | FCC-ID: 2ASL2-PD9 IC: N/A |
| **Test result** | **Passed** |

| | |
|---|---|
| **Possible test case verdicts:** | |
| - neither assessed nor tested ..... : | N/N |
| - required by standard but not appl. to test object ..... : | N/A |
| - required by standard but not tested ..... : | N/T |
| - not required by standard for the test object ..... : | N/R |
| - test object does meet the requirement ..... : | P (Pass) |
| - test object does not meet the requirement ..... : | F (Fail) |

| | | |
|---|---|---|
| **Testing:** | | |
| Date of receipt of test item ..... : | 2019-03-11 | |
| Date (s) of assessment ..... : | 2019-03-26 | |
| Compiled by ..... : | Christian Weber | |
| Assessed by (+ signature) ..... : (Responsible for Assessment) | Christian Weber | C. Weber ..... |
| Approved by (+ signature) ..... : (Deputy Head of Lab) | Toralf Jahn | T. J ..... |
| Date of issue ..... : | 2019-03-26 | |
| Total number of pages ..... : | 12 | |

**General remarks:**

**The test results presented in this report relate only to the object tested.**

**The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.**

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

**Additional comments:**

# Version History

| Version | Issue Date | Remarks | Revised by |
|---|---|---|---|
| 01 | 2019-03-26 | Initial Release | |



Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

## REPORT INDEX

# 1 Equipment (Test item) Description

| | |
|---|---|
| **Description** | Equine vital signs wireless monitoring device |
| **Model** | Piavita Measuring device |
| **Additional Model(s)** | None |
| **Brand Name(s)** | None |
| **Serial number** | None |
| **Hardware version** | V04 |
| **Software / Firmware version** | 2 |
| **PMN** | |
| **HVIN** | |
| **FVIN** | |
| **HMN** | |
| **FCC-ID** | 2ASL2-PD9 |
| **IC** | N/A |
| **Equipment type** | End product |

## 1.1 Reference Documents

| Document type | Document No. | Issued by | Date |
|---|---|---|---|
| Test Report | G0M-1902-8075-TFC247BL-V01 | Eurofins Product Service GmbH | 2019-03-25 |

### 1.2 Radiation Sources

| Mode # | Description | |
|---|---|---|
| Bluetooth LE | Frequency range [MHz] | 2402 – 2480 |
| | Channels | 40 |
| | Modulations | GFSK |
| | Maximum conducted power [dBm] | -0.151 |
| | Maximum transmission duty cycle [%] | 100 (worst case) |

## 2 Result Summary

| FCC 47 CFR Part 2.1093, KDB447498, IC RSS-102 | | | |
|---|---|---|---|
| **Product Specific Standard Section** | **Requirement** | **Result** | **Remarks** |
| 47 CFR 2.1093 KDB447498 | SAR evaluation exemption : Bluetooth LE | PASS | |
| RSS-102 2.5.1 | SAR evaluation exemption : Bluetooth LE | PASS | |
| **Remarks:** | | | |

## 3 RF-Exposure Classifications

| Device Types | |
|---|---|
| Fixed | A fixed device is defined as a device physically secured at one fixed location and cannot be easily re-located. |
| Mobile | A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. (47 CFR 2.1091) |
| Portable | A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. (47 CFR 2.1093) |

| Exposure Categories | |
|---|---|
| Occupational / Controlled | Limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure. |
| General population / uncontrolled | Exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure. |

# 4 Assessment

## 4.1 SAR Exemption Assessment –FCC KDB447498 / RSS-102

| **Low Power Exclusion acc. to FCC KDB447498 / IC RSS-102** | | **Verdict: PASS** |
|---|---|---|
| Assessment according to reference | Reference Method | |
| | KDB447498 & 2.1093 / RSS-102 & Safety Code 6 | |
| Device type | portable | |
| Exposure category | General population | |
| **FCC/ISED SAR Limits** | | |
| Region | Occupational SAR values [W/kg] | General public SAR values [W/kg] |
| Whole-body SAR averaging mass = entire body | 0.4 | 0.08 |
| Partial-body SAR averaging mass = 1g | 8.0 | 1.6 |
| Hands, Wrists, Feet and Ankles SAR averaging mass = 10g | 20 | 4 |

**FCC SAR test exclusion**

Excerpt from KDB 447498:

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander

The 1-g and 10-g SAR test exclusion thresholds for **100 MHz to 6 GHz** at *test separation distances* **≤ 50 mm** are determined by:

$$\frac{max.\ power\ of\ channel\ [mW]}{min.\ test\ separation\ distance\ [mm]} \cdot \sqrt{f[GHz]} \leq \begin{cases} 3.0 & 1g\ SAR \\ 7.5 & 10g\ SAR \end{cases}$$

- f [GHz] is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparision

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

**ISED SAR evaluation exemptions**

Excerpt from RSS-102 Issue 5:

**SAR evaluation is required** if the separation distance between the user and the radiating element of the **device is less than or equal to 20 cm, except** when the device operates at a power level below the following threshold limits:

| Frequency (MHz) | Exemption Limits (mW) | | | | |
|---|---|---|---|---|---|
| | At separation distance of ≤5 mm | At separation distance of 10 mm | At separation distance of 15 mm | At separation distance of 20 mm | At separation distance of 25 mm |
| ≤300 | 71 mW | 101 mW | 132 mW | 162 mW | 193 mW |
| 450 | 52 mW | 70 mW | 88 mW | 106 mW | 123 mW |
| 835 | 17 mW | 30 mW | 42 mW | 55 mW | 67 mW |
| 1900 | 7 mW | 10 mW | 18 mW | 34 mW | 60 mW |
| 2450 | 4 mW | 7 mW | 15 mW | 30 mW | 52 mW |
| 3500 | 2 mW | 6 mW | 16 mW | 32 mW | 55 mW |
| 5800 | 1 mW | 6 mW | 15 mW | 27 mW | 41 mW |

| Frequency (MHz) | Exemption Limits (mW) | | | | |
|---|---|---|---|---|---|
| | At separation distance of 30 mm | At separation distance of 35 mm | At separation distance of 40 mm | At separation distance of 45 mm | At separation distance of ≥50 mm |
| ≤300 | 223 mW | 254 mW | 284 mW | 315 mW | 345 mW |
| 450 | 141 mW | 159 mW | 177 mW | 195 mW | 213 mW |
| 835 | 80 mW | 92 mW | 105 mW | 117 mW | 130 mW |
| 1900 | 99 mW | 153 mW | 225 mW | 316 mW | 431 mW |
| 2450 | 83 mW | 123 mW | 173 mW | 235 mW | 309 mW |
| 3500 | 86 mW | 124 mW | 170 mW | 225 mW | 290 mW |
| 5800 | 56 mW | 71 mW | 85 mW | 97 mW | 106 mW |

For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation are multiplied by a factor of 2.5.

**Assessment procedure**

Standalone operation assessment:

For the radiation source included into the device the output power is taken from a corresponding RF test report. If needed the output power is converted to source based, time-averaged output power. Finally the output power is compared to the FCC and IC low power SAR evaluation exemption level.

Concurrent operation assessment:

The ratios of the power values and the corresponding limits are calculated and summed. The sum is compared to the maximum of 1.

| Assessment results Bluetooth LE | |
|---|---|
| Transmission mode | |
| Operating mode frequency range [MHz] | 2402 – 2480 |
| Assessment frequency [MHz] | 2480 |
| Transmission duty cycle [%] | 100 |
| Peak conducted power [dBm] | -0.151 |
| Minimum separation distance [mm] | 5.0 |
| Source-based, time averaged conducted power | |
| Duty cycle correction [dB] | 0.0 |
| Averaged conducted power [dBm] | -0.151 |
| Averaged conducted power [mW] | 0.966 |
| Source-based, time averaged radiated power | |
| Antenna gain [dBi] | 5 |
| Averaged radiated power [dBm e.i.r.p.] | 4.849 |
| Averaged radiated power [mW e.i.r.p.] | 3.054 |
| SAR evaluation exemption power levels | |
| FCC SAR test exclusion condition | $\frac{0.966[mW]}{5.0[mm]} \cdot \sqrt{2.480} = 0.3 \leq 3.0 \rightarrow$ PASS |
| ISED SAR test exclusion condition | $3.054\ mW \leq 4.0\ mW \rightarrow$ PASS |
| Verdict | |
| **The source-based, time-averaged output power of the EUT fulfills the SAR test exclusion requirements according to FCC KDB447498 and IC RSS-102** | |
| Comments: | |