

TEST REPORT
Nr. R23069201**Federal Communication Commission (FCC)**

| | |
|-------------------------------------|---|
| Report Reference No. | R23069201 |
| Date of issue: | 21.06.2023 |
| Total number pages: | 15 |
| Customer name | Autec S.r.l. |
| Address | Via Pomaroli, 65 – 36030 Caldognو (VI) – Italy |
| Test specification: | |
| Standards | KDB 447498 D01 General RF Exposure Guidance v06 |
| Non-standard test method | N/A |
| Test Report Form No. | 15-247_HoppingDEKRA |
| Test Report Form(s) Originator ...: | DEKRA Testing and Certification S.r.l. |
| Master TRF | 2023-06 |

General disclaimer:

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

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| | |
|---|----------------------|
| (*) Test item description | Transceiver unit |
| (*) Trademark | Autec |
| (*) Manufacturer | Autec S.r.l. |
| (*) Model / Type reference | Model TWS Type NN1YH |
| (*) FCC ID | OQA-TWSNN1YH |
| (*) Rating(s) | 9-36 Vdc |

Report

Tested by (name + signature): M. Segalla



Approved by (name +
signature): F. Marendo



(*) information provided by the customer

| | | |
|----------|---|----|
| 1 | Summary | |
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|--|---|
| 2 Reference standard | |
| KDB 447498 D01 General RF Exposure Guidance v06 | RF exposure procedures and equipment authorization policies for mobile and portable devices |
| 3 List of attachments | |
| Attachment 1: Measurement uncertainty, judgement of compliance and quality manual references | |
| 4 Deviation(s) from test specification | |
| None | |
| 5 Testing location | |
| DEKRA Testing and Certification S.r.l. Via della Fisica, 20 – 36016 Thiene (VI) – Italy Test site facility's FCC registration number: 182474 | |

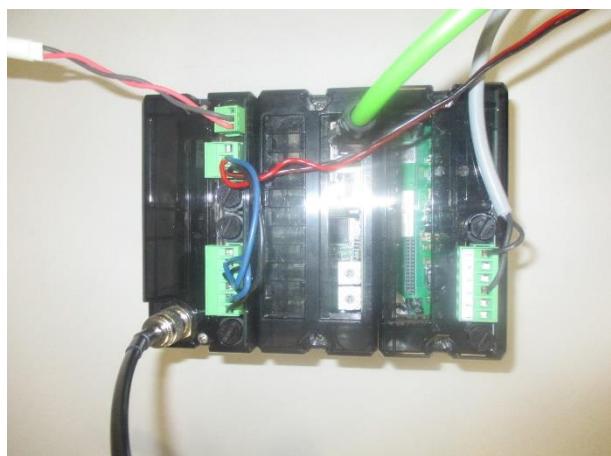
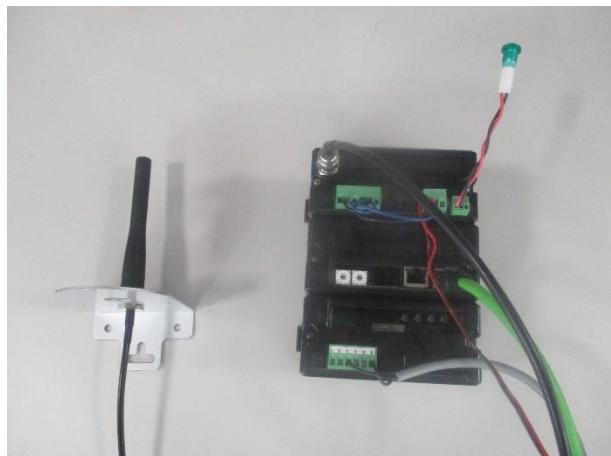
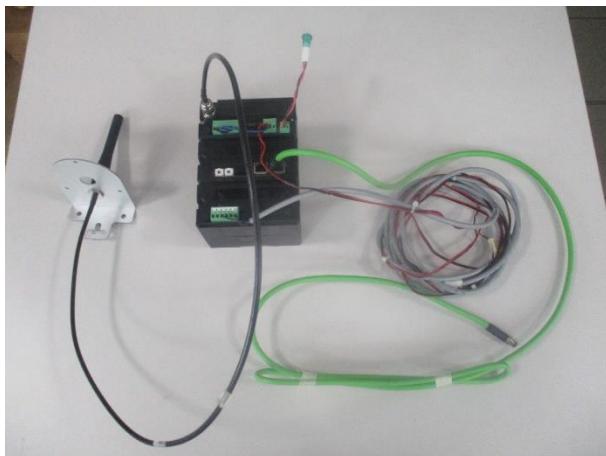
| Revision index | Date | Change history |
|-----------------------|-------------|-----------------------|
| 1.0 | 21.06.2023 | -- |

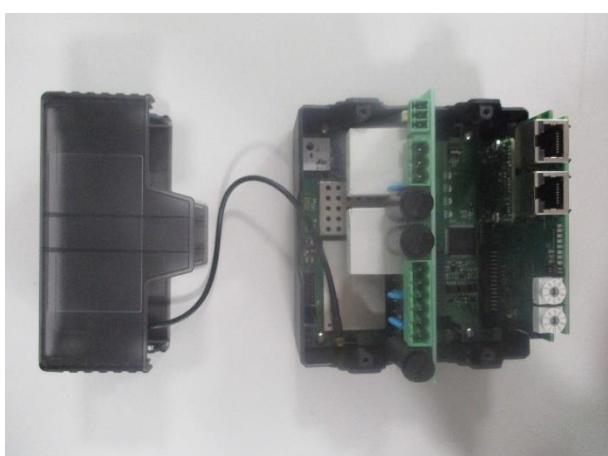
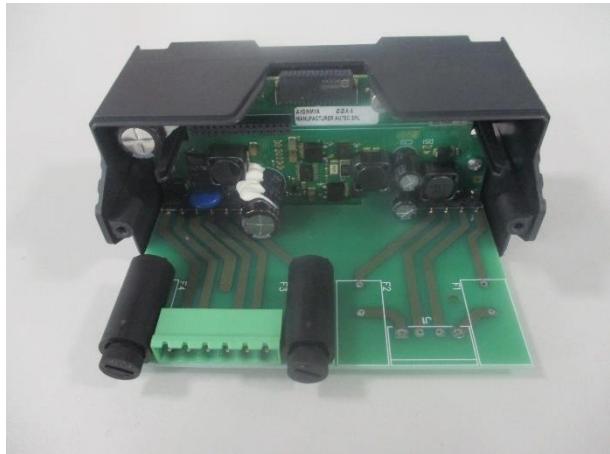
| Testing and sampling: | |
|---|--|
| Date of receipt of test item | 28.03.2023 |
| Testing start date | 21.06.2023 |
| Testing end date | 21.06.2023 |
| Sampling procedure | Sample used for testing chosen by the customer; DEKRA Testing and Certification S.r.l. cannot be considered responsible for the selection of the sample |
| Internal identification | Adhesive label with the product number P230271 |
| General remarks: | |
| This report shall not be reproduced, except in full, without the written approval of DEKRA Testing and Certification S.r.l. | |
| The test results presented in this report relate only to the object tested. | |
| "(see appended table)": refers to a table appended to the report. | |
| Throughout this report a comma is used as the decimal separator. | |
| Possible test case verdicts: | |
| Test case does not apply to the test object: | N/A (Not Applicable) |
| Test object does meet the requirement: | P (Pass) |
| Test object does not meet the requirement: | F (Fail) |
| Test object does not performed: | N/E (Not Executed) |
| Definition of symbols used in this test report: | |
| <input checked="" type="checkbox"/> | Indicates that the listed condition, standard or equipment is applicable for this report. |
| <input type="checkbox"/> | Indicates that the listed condition, standard or equipment is not applicable for this report. |

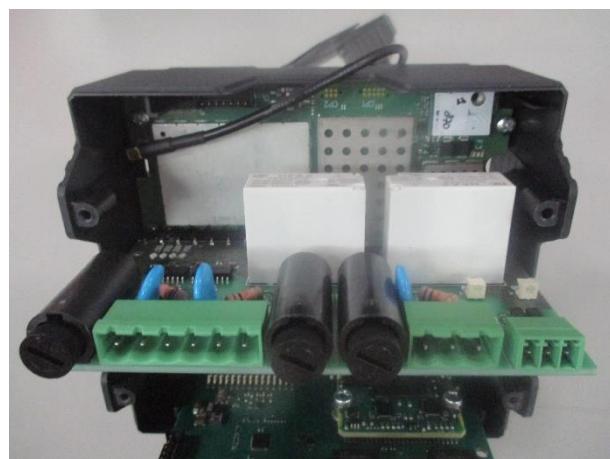
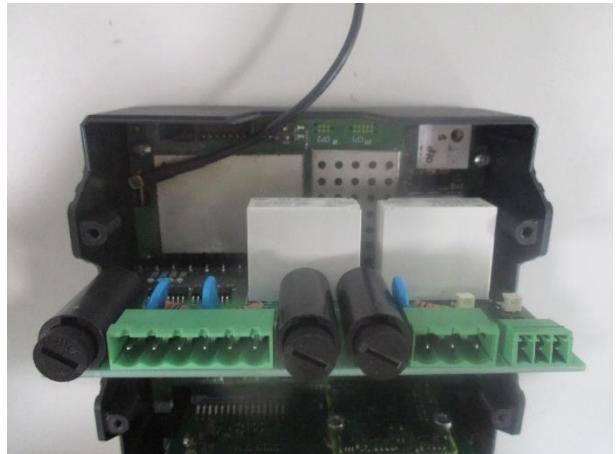
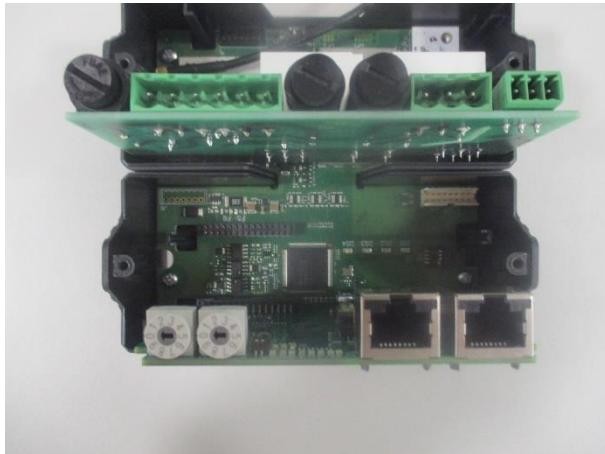
6 General description of tested item and testing condition(s)

| | | | | | | | | | | | |
|-------------------------------------|---|--|---------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--|--|
| Description | Transceiver unit | | | | | | | | | | |
| Model Number | Model TWS Type NN1YH | | | | | | | | | | |
| FCC ID | OQA-TWSNN1YH | | | | | | | | | | |
| Serial Number..... | -- | | | | | | | | | | |
| Brand name | Autec | | | | | | | | | | |
| Frequency band..... | 902 – 928 MHz | | | | | | | | | | |
| Nominal frequencies | F_L : 915,050 MHz | F_M : 921,400 MHz | F_H : 927,800 MHz | | | | | | | | |
| Test power supply..... | | Voltage and Frequency | | Reference poles | | | | | | | |
| | | | | N | L1 | L2 | L3 | PE | | | |
| | | <input type="checkbox"/> AC: | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| | | <input type="checkbox"/> AC: | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| Type of equipment | | <input checked="" type="checkbox"/> Transmitter unit | | | | | | | | | |
| | | <input checked="" type="checkbox"/> Receiver unit | | | | | | | | | |
| Type of station | | <input type="checkbox"/> Portable station | | | | | | | | | |
| Test arrangements of EUT | <i>Intended operational arrangement(s) of EUT</i> | | | <i>Test arrangement (see basic standard)</i> | | | | | | | |
| | <input type="checkbox"/> Table-top only | | | Table-top | | | | | | | |
| | <input type="checkbox"/> Floor-standing only | | | Floor-standing | | | | | | | |
| | <input type="checkbox"/> Can be floor-standing or table-top | | | Table-top | | | | | | | |
| | <input type="checkbox"/> Rack mounted | | | In rack or table-top | | | | | | | |
| | <input checked="" type="checkbox"/> Other, for example wall mounted, ceiling mounted, handheld, body worn | | | Table-top | | | | | | | |
| Operating modes | No. | Operating mode of test item | | | | | | | | | |
| | 1 | EUT in continuous transmission at maximum power | | | | | | | | | |
| Declination of responsibility | <p>Information relating to the description of the sample, components list and software/hardware version (if reported) are provided by the customer. DEKRA Testing and Certification S.r.l. cannot be considered responsible for these information, for any other document sent by the customer and for any difference between the software version present in the tested sample and that present in the object intended for final sale.</p> <p>In some cases, the software in the tested sample is in a version dedicated exclusively to the test, and therefore does not represent the software installed in the final version of the product.</p> | | | | | | | | | | |

6.1 Photos of the test item







7 Verdict summary section

| KDB 447498 D01 General RF Exposure Guidance v06 | | | |
|---|-------------------------|----------------|---------|
| Clause | Requirement – Test case | Basic standard | Verdict |
| 7.1 | RF Exposure Analysis | -- | P |

Normative references

| Reference no. | Description |
|---|---|
| KDB 447498 D01 General RF Exposure Guidance v06 | RF exposure procedures and equipment authorization policies for mobile and portable devices |

8 Test conditions

8.1 General

| Environmental reference conditions.....: | <p>The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment.</p> <p>The climatic conditions during the tests were within the following limits:</p> <table border="1"><thead><tr><th>Temperature</th><th>Humidity</th><th>Atmospheric pressure</th></tr></thead><tbody><tr><td>15 °C – 35 °C</td><td>30 % - 60 %</td><td>800 hPa – 1060 hPa</td></tr></tbody></table> <p>If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.</p> | | | Temperature | Humidity | Atmospheric pressure | 15 °C – 35 °C | 30 % - 60 % | 800 hPa – 1060 hPa |
|--|--|----------------------|--|-------------|----------|----------------------|---------------|-------------|--------------------|
| Temperature | Humidity | Atmospheric pressure | | | | | | | |
| 15 °C – 35 °C | 30 % - 60 % | 800 hPa – 1060 hPa | | | | | | | |
| Measurement uncertainties: | Attachment 1 | | | | | | | | |

9 Test results

9.1 RF Exposure Analysis

| | |
|---------------------------------|-------------------------------------|
| Tested by | M. Segalla |
| Test date | 21.06.2023 |
| Test location (stand) | Laboratory |
| Reference standards..... | KDB 447498 D01 cl. 4 ANSI C63.10 |
| Supplementary information | -- |

Acceptance limits

For mobile devices operating at frequency f between 300 kHz and 6 GHz the power density limit at 20 cm is $f(\text{MHz})/1500 \text{ mW/cm}^2$ according to FCC Part 1.1310(e)(1) Table 1

Results

| Transmission channel (MHz) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density at 20 cm (mW/cm ²) | Power Density Limit (mW/cm ²) |
|----------------------------|-------------------------|------------------------|--|---|
| 915,05 | 15,95 | 39,36 | 0,010 | 0,610 |
| 921,40 | 15,58 | 36,14 | 0,010 | 0,614 |
| 927,80 | 15,38 | 34,51 | 0,009 | 0,619 |

Remarks: Power Density = $(P \times G) / (4\pi R^2)$

Where:

P = the power in mW

G = the numeric gain of the transmitting antenna: 1,326 (1,227 dBi)

R = the reference distance (20 cm)

Attachment 1

Measurement uncertainty

| Test | Test Setup | Expanded uncertainty | | Note |
|--|------------|----------------------|----|-------------------|
| Conducted emission CISPR 16 <u>LISN 50uH 0,009-0,0150 MHz</u> | PE001_01 | 3,4 | dB | 1 |
| Conducted emission CISPR 16 <u>LISN 50uH 0,150-30,0 MHz</u> | PE001_01 | 2,9 | dB | 1 |
| Conducted emission CISPR 16 <u>Voltage Probe 0,15-30 MHz</u> | PE001_02 | 2,1 | dB | 1 |
| Conducted emission CISPR 16 <u>Current Probe 0,15-30 MHz</u> | PE001_03 | 2,5 | dB | 1 |
| Conducted emission CISPR 16 <u>ISN 0,15-30 MHz</u> | PE001_04 | 4,7 | dB | 1 |
| Clic CISPR 16 <u>LISN 50uH 0,150-30,0 MHz</u> | PE001_05 | 2,9 | dB | 1 |
| Radiated Emission CDNE <u>30-300 MHz</u> | PE001_06 | 3,3 | dB | 1 |
| Disturbance Power <u>30-300 MHz</u> | PE002_01 | 3,7 | dB | 1 |
| Radiated Emission LAS <u>0,15-30 MHz</u> | PE003_01 | 1,9 | dB | 1 |
| Radiated Emission CISPR 16 <u>Loop Ant. 0,15-30 MHz</u> | PE004_01 | 4,1 | dB | 1 |
| Radiated Emission CISPR 16 <u>Bicon. Ant. 30-300 MHz</u> | PE004_02 | 4,6 | dB | 1 |
| Radiated Emission CISPR 16 <u>LogP. Ant. 300-1000 MHz</u> | PE004_03 | 4,5 | dB | 1 |
| Radiated Emission CISPR 16 <u>Horn Ant. 1-18 GHz</u> | PE004_04 | 4,7 | dB | 1 |
| Human Exposure to electromagnetic fields | PE005_01 | 14,2 | % | 1 |
| Harmonics | PE006_01 | 10 mA | + | 2,9 % |
| Flicker | PE007_01 | | | 4,20 % |
| Radiated Immunity <u>80 MHz - 6 GHz</u> | PE102_XX | 2,25 | dB | 0,89 V/m a 3V/m |
| Conducted Immunity <u>0,15 - 230 MHz</u> | PE105_XX | 1,19 | dB | 0,44 V a 3V |
| AC Magnetic field | PE106_01 | 1,55 | % | 0,15 A/m a 10A/m |
| Pulse Magnetic field | PE107_01 | 6,25 | % | 18,8 A/m a 300A/m |
| Dumped Magnetic field | PE108_01 | 6,25 | % | 1,88 A/m a 30A/m |
| Common mode conducted immunity | PE112_01 | 2,22 | % | 0,22 V a 10V |

Attachment 1

| Test | Test Setup | Expanded uncertainty | Note |
|--|-------------|----------------------|------|
| Power/Spurious 9kHz-30MHz | PR001_01 | 4,1 dB | 1 |
| Power/Spurious ERP 30-1000MHz d=10m | PR001_02+03 | 4,7 dB | 1 |
| Misura della potenza EiRP 1-18GHz d=3m | PR001_04+05 | 4,7 dB | 1 |
| Misura della potenza EiRP 18-40GHz d=3m | PR001_06 | 5,1 dB | 1 |
| Frequency error | PR002_01+02 | < 1x10-7 | 1 |
| Timing zero span (1001pts.) | PR002_01+02 | 0,2 % SWT | 1 |
| Modulation bandwidth | PR002_01+02 | < 1x10-7 | 1 |
| Conducted RF power and spurious emission | PR002_01+02 | 1,1 dB | 1 |
| Adjacent channel power | PR002_01+02 | 1,1 dB | 1 |
| Blocking | PR002_01+02 | 1,1 dB | 1 |

| Test | Test Setup | Expanded uncertainty | Note |
|--|------------|----------------------|------|
| Electrostatic discharge immunity test | PE101_0X | | 2 |
| Electrical fast transients / burst immunity test | PE103_0X | | 2 |
| Surge immunity test | PE104_0X | | 2 |
| Short interruption immunity test | PE109_01 | | 2 |
| Ring Wave immunity test | PE110_01 | | 2 |
| Low frequency immunity test | PE111_01 | | 2 |
| Dumped Oscillatory immunity test | PE113_01 | | 2 |

Rev_23_01 date 20/03/2023

Note 1:

The expanded uncertainty reported according to the document EA-4-02 is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of p = 95%

Note 2:

It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95% confidence, covering factor k=2

Attachment 1

Judgement of compliance

| Case 1 | Case 2 | Case 3 | Case 4 |
|--|---|--|--|
| <p>The sample complies with the requirements.</p> <p>The measurement results is within the specification limit when the measurement uncertainty is taken into account.</p> | <p>The sample complies with the requirements.</p> <p>It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty although the measurement result is below the limit.</p> | <p>The sample does not comply with the requirements.</p> <p>It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty also the measurement result is upper the limit.</p> | <p>The sample does not comply with the requirements.</p> <p>The measurement results is outside the specification limit when the measurement uncertainty is taken into account.</p> |

In agreement with ILAC-G8:09/2019 cl.4.2.1 Guidelines on Decision Rules and Statements of Conformity

Quality manual references – Internal procedure

| | |
|---|-------------------------------------|
| Internal Procedure PM001 rev. 4.0 (Quality Manual) | Measure procedure |
| Internal Procedure INC_M rev. 10.0 (Quality Manual) | Measurement uncertainty calculation |