

TEST REPORT

Title 47-Telecommunication

Chapter I - Federal Communications Commission

Subchapter A - General

Part 1 - Practice and procedure

Subpart I - Procedures Implementing the National Environmental Policy Act of 1969

Report Reference No. 381371-2TRFEMF

Tested by
(name, function and signature) P. Barbieri (project handler) 

Approved by
(name, function and signature) D. Guarnone (verifier) 

Date of issue 2020-05-15

Testing Laboratory **Nemko Spa**

Address Via del Carroccio, 4 – 20853 Biassono (MB) – Italy

Testing location Nemko Spa

Address Via del Carroccio, 4 – 20853 Biassono (MB) – Italy

Registration number: 682159 and 9109A

Applicant's name **Inventis SRL**

Address Corso Stati Uniti, 1/3 – 35127 Padova (PD) – Italia

Test specification:

Standard FCC CFR 47 Part 1 Subpart I
§1.1310 – Radiofrequency radiation exposure limits ☒

Test procedure Nemko WM L0077, WM L0177 and WM L1002

Test Report Form No. FCCTRF

TRF Originator Nemko Spa

Master TRF 2014-03

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Test item description **Real ear measurement system + Audiometer**

Trade Mark Inventis

Manufacturer Inventis SRL

Address of manufacturer Corso Stati Uniti, 1/3 – 35127 Padova (PD) – Italia

FCC ID 2AVOO-RE1RA

Model TRUMPET REM & AUD Wireless

Variants Trumpet REM & AUD; Trumpet REM Wireless; Trumpet REM;
Trumpet AUD

Ratings 100 – 240 V ~ 47 – 63 Hz

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The test report merely corresponds to the tested sample.

The phase of sampling / collection of equipment under test is carried out by the customer.

This Test Report, when bearing the Nemko name and logo is only valid when issued by a Nemko laboratory, or by a laboratory having special agreement with Nemko.

Test Report No. : 381371-2TRFEMF
2020-05-15

Date of issue

Short description of the EuT and Copy of marking plate

Trumpet is a real ear measurement system. A real ear measurement system allows the determination of the intensity of sounds reaching the tympanic membrane of the patient. To this end it uses a couple of microphones, one located at the level of the patient's earlobe (the reference microphone), and one inserted in the patient ear canal through a silicon tube (the probe microphone). The operator, using the system, delivers to the patient sound stimuli different in intensity and in frequency content, and measures the intensity of the sound received by the two microphones. A real ear measurement system is generally used to quantify the gain provided by a hearing aid, when this is worn by the patient. Trumpet can be also an audiometer. An audiometer is a device that helps the operator in defining the patient's auditory sensitivity by generating and delivering to the patient sound stimuli of different types and intensities for diagnostic purposes.



Number of tested samples: 1
Serial number: RE1RA20100003
Operating frequency: 110 kHz to 205 kHz
Accessories and detachable parts included: The E.U.T. is composed of two units
Other options included: -

Testing

Date of receipt of test sample: 2020-05-15
Testing commenced on: 2020-05-15
Testing concluded on: 2020-05-15

Possible test case verdicts:

test case does not apply to the test object: N (Not applicable)
test object does meet the requirement: P (Pass)
test object does not meet the requirement: F (Fail)

Symbols used in this test report

- ☒ The crossed square indicates that the listed condition or equipment is applicable for this report.
- ☐ The empty square indicates that the listed condition or equipment is not applicable for this report.

Throughout this report point is used as decimal separator.

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.

Verdict according to the standards listed at page 5:

Pass

PROJECT HISTORY		
Report number	Modification to the report / comments	Date
381371-2TRFEMF	First release	2020-05-15
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REMARKS		
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PRODUCT VARIANTS		
Variant model	Difference against the main model	Test performed
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REMARKS		
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1 TEST STANDARDS

The tests were performed according to following standards and procedures.

NEMKO WM L0177: General routines for using instruments at Nemko

NEMKO WM L1002: Measurement Uncertainty - Policy and Statement

NEMKO WM L0077: General routines to perform EMC tests

FCC CFR 47 Part 1 Subpart I

Code of Federal Regulations – Title 47 – Part 1 Practice and procedure – Subpart I Procedures
Implementing the National Environmental Policy Act of 1969

The main standard above contains references to other standards, which are listed below.

KDB 680106 D01 RF Exposure Wireless Charging App v03

RF exposure considerations for low power consumer wireless power transfer applications

2 SUMMARY OF TEST RESULTS

FCC Part 1 Subpart I requirements			
Part	Test description	Frequency range	Verdict
§1.1310	Radiofrequency radiation exposure limits	100 kHz – 300 kHz	P
GENERAL REMARKS			

3 EQUIPMENT UNDER TEST

3.1 Power supply system utilised

Power supply voltage:	☐	230V/50 Hz / 1 ϕ	☒	115V/60Hz / 1 ϕ
	☐	400V/50 Hz 3PE	☐	400V/50 Hz 3NPE
	☐	3 V DC	☒	15 V DC

3.2 EuT operation modes

Mode	Description
1	Normal working performing a REM measurement with dedicated software

3.3 EuT configuration modes

The EuT was configured to measure its highest possible radiation level. The test modes selected are according to EuT instruction manual.

Mode	Description
1	The EUT has been tested supplied by its AC/DC adapter connected to the mains with the USB line connected to a PC. The other ports were not connected to their dedicated accessories.

3.4 Input/Output Ports

Port	Name	Type*	Cable Max. >3m	Cable Shielded	Description
0	ENCLOSURE	N/E	—	—	—
1	AC MAINS	AC	☐	☐	Standard cable
2	DC POWER	DC	☐	☐	120 cm cable from adapter
3	PAT. RESP	I/O	☐	☐	Standard cable with jack connector
4	BC	I/O	☐	☐	Standard cable with jack connector
5	AC L	I/O	☐	☐	Standard cable with jack connector
6	AC R	I/O	☐	☐	Standard cable with jack connector
7	TALK BACK	I/O	☐	☐	Standard cable with jack connector
8	TALK OVER	I/O	☐	☐	Standard cable with jack connector
9	SPK L	I/O	☒	☐	Two wires cable
10	SPK R	I/O	☒	☐	Two wires cable
11	RECD/INSERT L	I/O	☐	☐	Standard cable with jack connector
12	RECD/INSERT R	I/O	☐	☐	Standard cable with jack connector
13	RECD BOX	I/O	☐	☐	Multi wires cable

Port	Name	Type*	Cable Max. >3m	Cable Shielded	Description
14	CLIENT	I/O	☒	☐	Standard cable with jack connector
15	MON	I/O	☐	☐	Standard cable with jack connector
16	USB	I/O	☐	☒	Standard cable
17	SPK	I/O	☐	☐	Two wires cable
18	PROBE	I/O	☐	☐	Multi wires cable
*Note: AC = AC Power Port DC = DC Power Port N/E = Non-Electrical I/O = Signal/Control Input or Output Port TP = Telecommunication Ports					

3.5 Equipment Used During Test

Use*	Product Type	Manufacturer	Model	Remarks
EUT	AC/DC adapter	Sinpro	MPU31-106	—
EUT	Wireless REM probes	Inventis srl	—	—
EUT	Supra-aural headphones transducers	RadioEar	DD45	—
EUT	Supra-aural headphones transducers	RadioEar	TDH39	—
EUT	Insert earphones transducer	RadioEar	ER-3C	—
EUT	Bone vibrator transducer	RadioEar	B71	—
EUT	Monitor headset with boom microphone	Sennheiser	PC3	—
EUT	Talk back microphone	—	—	—
EUT	Patient response switch	Inventis srl	—	—
EUT	RECD loudspeaker	—	—	—
AE	PC	HP	ProBook 430 G6	—
SIM	Load resistor 6K	As termination simulating external passive speakers		
SIM	Load resistor 10K	As termination simulating transducers		
Note: * Use:				
EUT - Equipment Under Test				
AE - Auxiliary/Associated Equipment (Not Subjected to Test)				

3.6 Test software

The following test software has been used during the tests:



SW: Maestro 1.11.0, FW: 3.0.X

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

Nemko Spa
Via del Carroccio, 4
20853 Biassono (MB) - Italy

Tests site/benches are in accordance with applicable standard/s, and have been utilized by Nemko Spa testing engineer(s).

4.2 Environmental conditions

In the laboratory, the following ambient conditions are respected for each test reported below:

Ambient temperature: 18 ÷ 33 °C ⁽¹⁾

Relative Humidity: 25 ÷ 70 % ⁽²⁾

Atmospheric pressure: 860 ÷ 1060 hPa

⁽¹⁾ For luminaire, temperature during tests was verified to be within 18 ÷ 30 °C

⁽²⁾ During ESD test, humidity was verified to be within 30 ÷ 60 %

The following instruments are used to monitor the environmental conditions:

Equipment	Manufacturer	Model	Serial N°
Thermo-hygrometer data loggers	Testo	175-H2	20012380/305
Thermo-hygrometer data loggers	Testo	175-H2	38203337/703
Barometer	Castle	GPB 3300	072015

4.3 Statement of the measurement uncertainty

The measurement uncertainty was calculated for each test and quantity listed in this test report, according to CISPR 16-4-2 and other specific test standard and is documented in Nemko Spa working manual WML1002.

The assessment of conformity for each test performed on the equipment is performed not taking into account the measurement uncertainty. The two following possible verdicts are stated in the report:

P (Pass) - The measured values of the equipment respect the specification limit at the points tested. The specific risk of false accept is up to 50% when the measured result is close to the limit.

F (Fail) - One or more measured values of the equipment do not respect the specification limit at the points tested. The specific risk of false reject is up to 50% when the measured result is close to the limit.

Hereafter Nemko's measurement uncertainties are reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Disturbance 10m Chamber	Antenna distance 3 m, 10 m 0.009 ÷ 200 MHz	5.0 dB	(1)
	Antenna distance 1 m, 3 m, 10 m 200 ÷ 1000 MHz	5.2 dB	(1)
	Antenna distance 1 m, 3 m, 10 m 1 ÷ 6 GHz	5.2 dB	(1)
	Antenna distance 1 m, 3 m 6 ÷ 18 GHz	5.5 dB	(1)
	Antenna distance 1 m, 3 m 18 ÷ 40 GHz	7.2 dB	(1)
Radiated Disturbance with large loop antenna system (LLAS)	0.009 ÷ 30 MHz	3.3 dB	(1)
Conducted Disturbance	0.02 ÷ 150 kHz with AMN	3.8 dB	(1)
	150 kHz ÷ 30 MHz with AMN	3.4 dB	(1)
	150 kHz ÷ 30 MHz with AAN	4.6 dB	(1)
	9 kHz ÷ 30 MHz with voltage probe	2.9 dB	(1)
	150 kHz ÷ 30 MHz with current probe	2.9 dB	(1)
Clicks	9 ÷ 150 kHz	3.8 dB	(1)
	150 kHz ÷ 30 MHz	3.4 dB	(1)
Disturbance Power	30 MHz ÷ 300 MHz	4.5 dB	(1)
Frequency	10 Hz ÷ 1 kHz	0.2 %	(1)
	1 kHz ÷ 40 GHz	10 ⁻⁶	(1)
Harmonic Current Emission	50 Hz ÷ 2 kHz	3 %	(1)
Fluctuation and Flickers	Fluctuation	0.05 %	(1)
	Flickers	5 %	(1)
Radiated Immunity Anechoic Chambers	20 MHz ÷ 6 GHz	3.4 dB	(1) (3)
Radiated Immunity TEM Cell	0.01 ÷ 200 MHz	3.0 dB	(1) (3)
Bulk Current	1 ÷ 200 MHz	3.0 dB	(1)
Immunity to conducted disturbances	9 kHz ÷ 230 MHz	3.0 dB	(1)
ESD Immunity	Voltage, Current, Rise time, Duration	(2)	(1)
Burst Immunity	Voltage, frequency, burst period and duration, rise time and pulse width	(2)	(1)
Surge Immunity	Voltage, Current, Rise time, Duration	(2)	(1)
DIPS, Interruption and Voltage duration Immunity	Amplitude	5 %	(1)
	Duration	5 %	
Impulse Magnetic Field Immunity	Peak Current	10 %	(1) (3)
	Rise time, Duration	20 %	
Power Frequency Magnetic Field Immunity	16.7 Hz, 50 Hz, 60 Hz	2.0 dB	(1) (3)
Damped Oscillatory Wave Immunity Ring Wave Immunity	Voltage, front time, frequency 100 kHz, 1 MHz	(2)	(1)
Damped Magnetic Field	Amplitude: 100 kHz, 1 MHz	3 dB	(1)
	Frequency: 100 kHz, 1 MHz	10 %	
Low Frequency Immunity	15 Hz ÷ 150 kHz	2.2 dB	(1)
Automotive transients Immunity	Voltage, rise time, duration time Impulses 1, 2a, 2b, 3a, 3b and 4	(2)	(1)
Automotive transients Emission	Amplitude, Time	10 %	(1)
EMF for Lighting Equipment	-	25 %	(1)
Electromagnetic fields (EMF)	Magnetic, Electric and Electromagnetic fields: 0 Hz ÷ 40 GHz	25 %	(1)
Electrical quantities (voltage, current, resistance)	AC/DC Voltage 10 mV ÷ 1000 V 0÷100 kHz AC/DC Current 0.1 mA ÷ 400 A 0÷1 kHz Resistance 100 mΩ ÷ 10 MΩ	2.5 %	(1)

NOTES:

(1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95 %

(2) The instruments used for this immunity test is according to the tolerances requested by the applicable standard

(3) The reported expanded uncertainty of measurement is related to the stimulus quantity

5 TEST CONDITIONS AND RESULTS

5.1 Radiofrequency radiation exposure limits

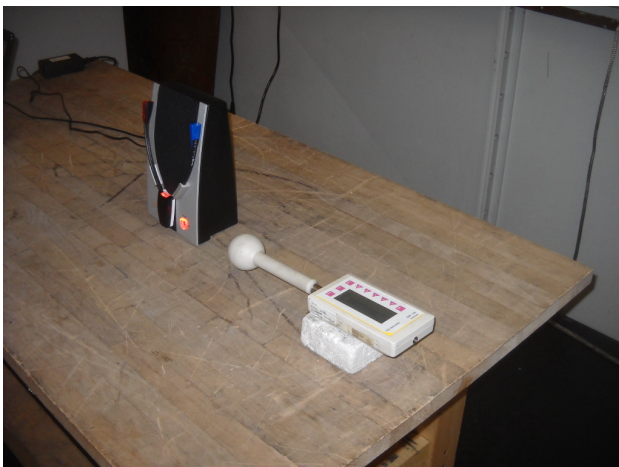
5.1.1 Photo documentation of the test set-up



Test set-up



Test on the frontal side



Test on the right side



Test on the left side



Test on the rear



Test above the top surface

5.1.2 Test method

For devices designed for typical desktop applications, such as wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 15 cm measured from the center of the probe(s) to the edge of the device.

5.1.3 Limits

The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils must be less than 50% of the MPE limit.

Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m.

5.1.4 Test result

Test point	Distance	E-field strengths	H-field strengths	Verdict
Front side	15 cm	2.1 V/m	0.19 A/m	P
Right side	15 cm	1.7 V/m	0.06 A/m	P
Left side	15 cm	1.8 V/m	0.05 A/m	P
Rear side	15 cm	1.7 V/m	0.05 A/m	P
Above the top	20 cm	2.2 V/m	0.02 A/m	P

Verdict:	☒ P ☐ F ☐ N
Frequency range:	100 kHz – 300 kHz
Kind of test site:	Shielded room
Remarks:	

5.1.5 Test equipment used

Equipment	Manufacturer	Model	Serial N°	Cal Date	Due Date
Field meter	Maschek	ESM-100	971909-G	2019-11	2020-11
Shielded room	Siemens	Conducted emission test room	1862	NSC	NSC

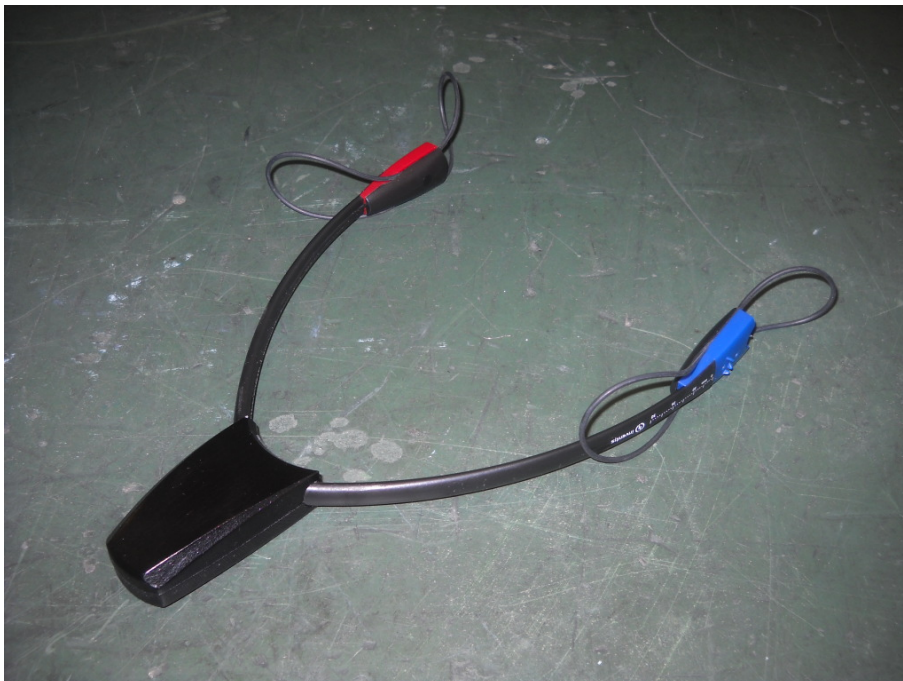
NSC = Not Subject to Calibration

5.1.6 Test software details

Manufacturer of Software	Details
Maestro 1.11.0	See clause 3.6

6 EUT PHOTOS





Accessories





End of report