# Test Report

## Client Information:

| | |
|---|---|
| Applicant: | SHENZHEN NITO POWER SOURCE TECHNOLOGY CO.,LTD. |
| Applicant add.: | 201, No.8 Building, JinfanghuaElectricity Industrial park, Bantian St., Longgang Dist., Shenzhen, China |

## Product Information:

| | |
|---|---|
| Product Name: | Magnetic Wireless Car Charger Holder |
| Model No.: | JR-ZS295, JR-ZS331,JR-ZS332 |
| Brand Name: | JOYROOM |

**Standards:** EN IEC 62311: 2020

## Prepared By:

**Dongguan Yaxu (AiT) Technology Limited**

Add. : No.22, Jinqianling Third Street, Jitigang, Huangjiang, Dongguan, Guangdong, China

| | | | |
|---|---|---|---|
| Date of Receipt: | May 19, 2022 | Date of Test: | May 19~ May 25, 2022 |
| Date of Issue: | May 26, 2022 | Test Result: | Pass |

This device has been tested and found to comply with the stated standard(s), which is (are) required by the council directive of 2014/53/EU and indicated in the test report and are applicable only to the tested sample identified in the report.

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**Reviewed by:** Simba Huang
Simba huang

**Approved by:** Seal chen
Seal.chen

# 1 Contents



# 2 Test Summary

## 2.1 Applicable Standard

This International Standard applies to electronic and electrical equipment for which no dedicated productor product family standard regarding human exposure to electromagnetic fields applies.
The frequency range covered is 0 Hz to 300 GHz.
The object of this generic standard is to provide assessment methods and criteria to evaluate such equipment against basic restrictions or reference levels on exposure of the general public related to electric, magnetic and electromagnetic fields and induced and contact current.

## 2.2 Measurement Uncertainty

| No. | Item | Uncertainty |
|---|---|---|
| 1 | Conducted Emission Test | ±1.20dB |
| 2 | Radiated Emission Test | ±3.75dB |

# 3 Test Facility

**The test facility is recognized, certified or accredited by the following organizations:**

**. CNAS- Registration No: L6177**

Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2017 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on Aug.04, 2020

**FCC-Registration No.: 703111 Designation Number: CN1313**

Dongguan Yaxu (AiT) technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

**IC —Registration No.: 6819A CAB identifier: CN0122**

The 3m Semi-anechoic chamber of Dongguan Yaxu (AiT) technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 6819A

**A2LA-Lab Cert. No.: 6317.01**

Dongguan Yaxu (AiT) technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

## 3.1 Deviation from standard

None

## 3.2 Abnormalities from standard conditions

None

# 4 General Information

## 4.1 General Description of EUT

| | |
|---|---|
| Applicant: | SHENZHEN NITO POWER SOURCE TECHNOLOGY CO.,LTD. |
| Applicant Address: | 201, No.8 Building, JinfanghuaElectricity Industrial park, Bantian St., Longgang Dist., Shenzhen, China |
| Manufacturer: | Xiaozhi (Dongguan) Technology Co., Ltd |
| Manufacturer Address: | RM 502, No. 4 Building, No. 302 TanglongXi Road, Tangxia Town, Dongguan, Guangdong |
| EUT Name: | Magnetic Wireless Car Charger Holder |
| Model No.: | JR-ZS295 |
| Derivative model No.: | JR-ZS331,JR-ZS332 |
| Brand Name: | JOYROOM |
| Frequency Bands: | 110kHz~205kHz |
| Modulation Mode: | FSK |
| Antenna Gain: | Maximum 0 dBi |
| Power Supply Range: | Input: 5V/2A,9V/2A,12V/2A<br>Output:5V/1A,7.5V/1A,9V/1.1A,12V/1.25A |
| Power Supply: | Input: 5V/2A,9V/2A,12V/2A<br>Output:5V/1A,7.5V/1A,9V/1.1A,12V/1.25A |
| Model different: | N/A |

# 5 Applicable Standard

EN IEC 62311:2020: Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz to 300 GHz)

## 5.1 Limit

Basic restriction for electric, magnetic and electromagnetic fields (0Hz to 300GHz)

| Frequency range | Magnetic flux density (mT) | Current density ($mA/m^2$) | Whole body average SAR(W/kg) | Localised SAR (head and trunk)(W/kg) | Localised SAR (limbs) (W/kg) | Power density, S ($W/m^2$) |
|---|---|---|---|---|---|---|
| 0Hz | 40 | -- | -- | -- | -- | -- |
| >0-1Hz | -- | 8 | -- | -- | -- | -- |
| 1-4Hz | -- | 8/f | -- | -- | -- | -- |
| 4-1000Hz | -- | 2 | -- | -- | -- | -- |
| 1000Hz-100khz | -- | f/500 | -- | -- | -- | -- |
| 100khz-10Mhz | -- | f/500 | 0.08 | 2 | 4 | -- |
| 10Mhz-10Ghz | -- | -- | 0.08 | 2 | 4 | -- |
| 10-300Ghz | -- | -- | -- | -- | -- | 10 |

Notes:

1. f is the frequency in Hz.

2. The basic restriction on the current density is intended to protect against acute exposure effects on central nervous system tissues in the head and trunk of the body and includes a safety factor. The basic restrictions for ELF fields are based on established adverse effects on the central nervous system. Such acute effects are essentially instantaneous and there is no scientific justification to modify the basic restrictions for exposure of short duration. However, since the basic restriction refers to adverse effects on the central nervous system, this basic restriction may permit higher current densities in body tissues other than the central nervous system under the same exposure conditions.

3. Because of electrical inhomogeneity of the body, current densities should be averaged over a cross section of 1cm2 perpendicular to the current direction.

4. For frequencies up to 100 kHz, peak current density values can be obtained by multiplying the rms value by √2(=1.414). For pulses of duration $t_p$ the equivalent frequency to apply in the basic restrictions should be calculated as=1/ ($2t_p$)

5. For frequencies up to 100kHz and for pulsed magnetic fields, the maximum current density associated with the pulses can be calculated from the rise/fall times and the maximum rate of change of magnetic flux density. The induced current density can then be compared with the appropriate basic restriction.

6. All SAR values are to be averaged over any six-minute period.

7. Localised SAR averaging mass is any 10g of contiguous tissue; the maximum SAR so obtained should be the value used for the estimation of exposure. These 10g of tissue are intended to be a mass of contiguous tissue with nearly homogeneous electrical properties. In specifying a contiguous mass of tissue,

it is recognised that this concept can be used in computational dosimetry but may present difficulties for direct physical measurements. A simple geometry such as cubic tissue mass can be used provided that the calculated dosimetric quantities have conservation values relative to the exposure guidelines.

8. For pulses of duration tp the equivalent frequency to apply in the basic restrictions should be calculated as=$1/(2t_p)$. Additionally, for pulsed exposures, in the frequency range 0,3 to 10GHz and for localised exposure of the head, in order to limit and avoid auditory effects caused by thermoelastic expansion, an additional basic restriction is recommended. This is that SA should not exceed 2mJ kg-1 averaged over 10g of tissue.

Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz, unperturbed rms values)

| Frequency range | E-field strength (V/m) | H-field strength (A/m) | B-field (uT) | Equivalent plane wave power density $S_{eq}$($W/m^2$) |
|---|---|---|---|---|
| 0-1Hz | -- | $3.2\times10^4$ | $4\times10^4$ | -- |
| 1-8Hz | 10000 | $3.2\times10^4/f^2$ | $4\times10^4/f^2$ | -- |
| 8-25Hz | 10000 | 4000/f | 5000/f | -- |
| 0.025-0.8KHz | 250/f | 4/f | 5/f | -- |
| 0.8-3KHz | 250/f | 5 | 6.25 | -- |
| 3-150KHz | 87 | 5 | 6.25 | -- |
| 0.15-1MHz | 87 | 0.73/f | 0.92/f | -- |
| 1-10MHz | $87/f^{1/2}$ | 0.73/f | 0.92/f | -- |
| 10-400MHz | 28 | 0.073 | 0.092 | 2 |
| 400-2000MHz | $1.375f^{1/2}$ | $0.0037f^{1/2}$ | $0.0046f^{1/2}$ | f/200 |
| 2-300GHz | 61 | 0.16 | 0.20 | 10 |

Notes: 1. As indicated in the frequency range column.

2. For frequencies between 100kHz and 10GHz, $S_{eq}$, $E^2$, $H^2$ and $B^2$ are to be averaged over any six-minute period.

3. For frequencies exceeding 10GHz, $S_{eq}$, $E^2$, $H^2$ and $B^2$ are to be averaged over any $68/f^{1.05}$-minute period (.in GHz).

4. No E-field value is provided for frequencies <1Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 20kV/m. Spark discharges causing stress or annoyance should be avoided.

**Occupational Exposure limit and action values for relectromahnetic fields**

Exposure limit values(Article3(1)).All conditions to be satisfied

| Frequency range | Current density for head and trunk J ($mA/m^2$) (rms) | Whole body average SAR(W/kg) | Localised SAR (head and trunk)(W/kg) | Localised SAR (limbs) (W/kg) | Power density, S ($W/m^2$) |
|---|---|---|---|---|---|
| Up to 1Hz | 40 | -- | -- | -- | -- |
| 1-4Hz | 40/f | -- | -- | -- | -- |
| 4-1000Hz | 10 | -- | -- | -- | -- |
| 1000Hz-100kHz | f/100 | -- | -- | -- | -- |
| 100kHz-10MHz | f/100 | 0.4 | 10 | 20 | -- |
| 10MHz-10GHz | -- | 0.4 | 10 | 20 | -- |
| 10-300GHz | -- | -- | -- | -- | 50 |

Notes:

1. f is the frequency in Hz.

2. The exposure limit values on the current density are intended to protect against acute exposure effects on central nervous system tissues in the head and trunk of the body.The exposure limit values in the frequency range 1Hz to 10MHz are based on established adverse effects on the central nervous system. Such acute effects are essentially instantaneous and there is no scientific justification to modify the exposure limit values for exposure of short duration. However, since the exposure limit values refer to adverse effects on the central nervous system, these exposure limit values may permit higher current densities in body tissues other than the central nervous system under the same exposure conditions.

3. Because of the electrical in homogeneity of the body,current densities should be calculated as averages over across-section of $1cm^2$ perpendicular to the current direction.

4. For frequencies up to 100kHz,peak current density values can be obtained by multiplying the rms value by $(2)^{½}$.

5. For frequencies up to 100kHz and for pulsed magneticfields, the maximum current density associated with the pulses can be calculated from the rise/fall times and the maximum rate of change of magnetic flux density.The induced current density can then be compared with the appropriate exposure limit value. For pulses of duration $t_p$, the equivalent frequency to apply for the exposure limit values should be calculated as $f=1/(2t_p)$.

6. All SAR values are to be averaged over any six-minute period.

7. Localised SAR averaging massis any 10 g of contiguous tissue; the maximum SAR so obtained should be the value used for estimating exposure. These 10 g of tissue are intended to be a mass of contiguous tissue with nearly homo-geneous electrical properties. In specifying a contiguous mass of tissue, it is recognised that this concept can beused in computational dosimetry but may present difficulties for direct physical measurements. As implegeometry such as cubict issue mass can be used providedth at the calculated dosimetric quantities have conservative values relative to the exposure guidelines.

8. For pulsed exposures in the frequency range 0.3 to 10GHz and for localised exposure of the head, in order to limit and avoid auditory effects caused by thermoelastic expansion,an additional exposure limit

value is recommended.This is that the SA should not exceed10mJ/kg averaged over 10g of tissue.

9. Power densities are to be averaged over any 20$cm^2$ of exposed area and any 68/$f^{1.05}$-minute period (where f is in GHz) to compensate for progressively shorter penetration depth as the frequency increases.Spatial maximum power densities averaged over 1$cm^2$ should not exceed 20 times the value of 50W/$m^2$.

10. With regard to pulsed or transient electromagnetic fields,or generally with regard to simultaneous exposure to multiple frequency fields,appropriate methods of assessment,measurement and/or calculation capable of analysing the characteristics of the waveforms and nature of biological interactions have to be applied,taking account of European harmonised standards developed by Cenelec.

The action values referred to in Table are obtained from the exposure limit values according to the rationale used by the International Commission on Non-ionising Radiation Protection(ICNIRP) in its guidelines on limiting exposure to non-ionising radiation(ICNIRP7/99).

Action values (Article3(2))(unperturbed rms values)

| Frequency range | Electric field strength, E(V/m) | Magnetic field strength, H(A/m) | Magnetic field strength, H(A/m) | Equivalent plane wave power density, Seq($W/m^2$) | Contact current, $I_C$(mA) | Limb induced current, $I_L$(mA) |
|---|---|---|---|---|---|---|
| 0-1Hz | - | $1.63x10^5$ | $2x10^5$ | - | 1.0 | - |
| 1-8Hz | 20000 | $1.63x10^5/f^2$ | $2x10^5/f^2$ | - | 1.0 | - |
| 8-25Hz | 20000 | $2x10^4/f$ | $2.5x10^4/f$ | - | 1.0 | - |
| 0.025-0.82kHz | 50/f | 20/f | 25/f | - | 1.0 | - |
| 0.82-2.5kHz | 500/f | 24.4 | 30.7 | - | 1.0 | - |
| 2.5-65kHz | 610 | 24.4 | 30.7 | - | 0.4f | - |
| 65-100kHz | 610 | 1600/f | 2000/f | - | 0.4f | - |
| 0.1-1MHz | 610 | 1.6/f | 2/f | - | 40 | - |
| 1-10MHz | 610/f | 1.6/f | 2/f | - | 40 | - |
| 10-110MHz | 61 | 0.16 | 0.2 | 10 | 40 | 100 |
| 110-400MHz | 61 | 0.16 | 0.2 | 10 | - | - |
| 400-2000MHz | $3f^{½}$ | $0.008f^{½}$ | $0.01f^{1/2}$ | f/40 | - | - |
| 2-300GHz | 137 | 0.36 | 0.45 | 50 | - | - |

Notes: 1. As indicated in the frequency range column.

2. For frequencies between100kHz and 10GHz,$S_{eq}$,E,H,Band $I_L$ are to be averaged over any six-minute period.

3. For frequencies exceeding 10GHz, $S_{eq}$,E,H and Bare to be averaged over any $68/f^{1.05}$-minute period(f in GHz)..

4. For frequencies up to 100kHz,peak action values for the field strength scan be obtained by multiplying the rms value by $(2)^{½}$. For pulses of duration $t_p$,the equivalent frequency to apply for the action values should be calculated as $f=1/(2t_p)$.

For frequencies between 100kHz and 10MHz,peak action values for the field strengths are calculated by multi-plying the relevant rms values by 10,where a=(0.665log(f/10)+0.176),finHz.

For frequencies between 10MHz and 300GHz, peak action values are calculated by multiplying the corresponding rms values by 32 for the field strengths and by 1000 for the equivalent planewave power density.

5. With regard to pulsed or transient electromagnetic fields,or generally with regard to simultaneous exposure to multiple frequency fields, appropriate methods of assessment, measurement and/or calculation capable of analysing the characteristics of the waveforms and nature of biologica linter actions have to be applied, taking account of harmonised European standards developed by Cenelec.

6. For peak values of pulsed modulated electromagnetic fields, it is also suggested that, for carrier frequencies exceeding 10MHz, $S_{eq}$ as averaged over the pulse width should not exceed 1000 times the $S_{eq}$ action values or that the field strength should not exceed 32 times the field strength action values for the carrier frequency.

## 5.2 EMF Assessment Method

Predication of MPE limit at a given distance
Equation from page 51 of EN50383, Edition 2002

$$E= \frac{\sqrt{30PG}}{r}$$

Where: E= E-field strength (V/m)
P=power input to antenna(Watt)
G=power gain of the antenna in the direction of interest relative to an isotropic radiator
r=distance to the center of radiation of the antenna

As declared by the Applicant, the EUT transmits with the maximum soure-baed Duty Cycle of 100%-see the User manual, and the EUT is a wireless device used in a mobile application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum mobile separation distance, r =20cm, the RF power density can be obtained.

## 5.3 Result

| Test Mode | Minimum Separation Distance(cm) | Output Power (dBμA/m) | Antenna Gain (dBi) | Antenna Gain (Nemeric) | E-field Strength Limit(V/m) | E-field Strength At 20cm(V/m) |
|---|---|---|---|---|---|---|
| TX | 20 | 15.45 | 0 | 1 | 610 | 0.00861 |

**Simultaneous Evaluation**

**not applicable**

# 6 Conclusion

The measurement results comply with the relevant limits for general exposure specified as reference levels in the Council Recommendation 1999/5/EC.

**End of report**