

MPE REPORT

Wireless charger

MODEL No.: X60, X70, X80, X90, X100

FCC ID: 2BCYR-X60

REPORT NO.:NCT23037264XE-2

ISSUE DATE: Sep. 21, 2023

Prepared for

ARK Ltd.

83 Pirie Dr, Hamilton, Ontario, Canada, L9H 6X6

Prepared by

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TEST REPORT DESCRIPTION

Applicant : ARK Ltd.
Address : 83 Pirie Dr, Hamilton, Ontario, Canada, L9H 6X6
Manufacturer : Shenzhen Lessmore Innovation Technology Ltd
Address : 2206, Building 177-180, Chuangye Garden, Beizhan Community, Minzhi Street, Longhua District, Shenzhen
EUT : Wireless charger
Model Name : X60, X70, X80, X90, X100
Trademark : N/A

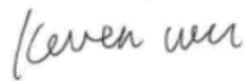
Measurement Procedure Used:

FCC Part 1(1.1310) and Part 2(2.1091)
680106 D01 RF Exposure Wireless Charging App v03

The device described above is tested by Shenzhen NCT Testing Technology Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen NCT Testing Technology Co., Ltd. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen NCT Testing Technology Co., Ltd.

Test Engineer:



Keven Wu / Engineer

Technical Manager:



Henry Wang / Manager



1. SUMMARY OF TEST RESULT

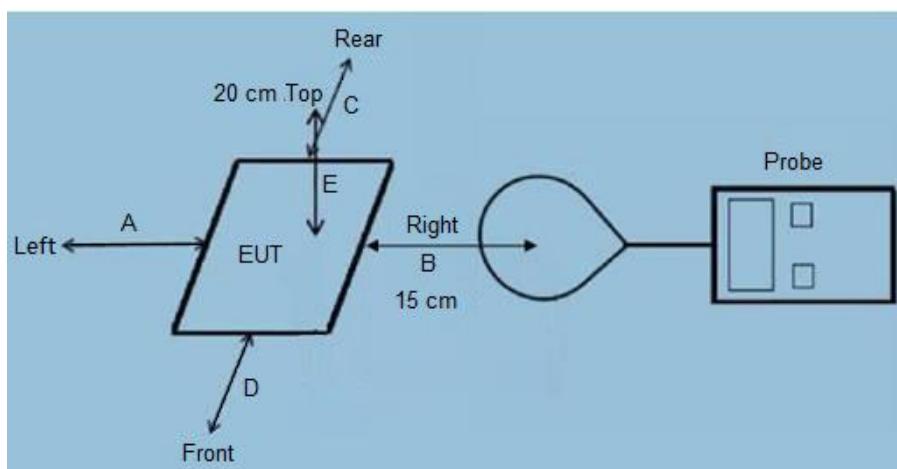
| EMISSION | | |
|--|--|---------|
| Description of Test Item | Standard & Limits | Results |
| MPE | FCC Part 1(1.1310) and Part 2(2.1091) 680106 D01 RF Exposure Wireless Charging App v03 | Pass |
| Note: N/A is an abbreviation for Not Applicable. | | |

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : Wireless charger
Model Number : X60
Series Number : X70, X80, X90, X100
Mode difference : All the same except the model number and the colour.
Power Rating : Input: 9V/2A
Output: 5W/7.5W/15W
Operation Frequency for WPT : 110-205KHz
Modulation : MSK
Antenna Type: Coil Antenna
Date of Received : Sep. 11, 2023
Date of Test : Sep. 11, 2023 to Sep. 21, 2023

2.2. Test Setup



2.3. Description of Test Facility

Site Description

EMC Lab. : Accredited by CNAS, 2022-09-27
The certificate is valid until 2028.01.07
The Laboratory has been assessed and proved to be in compliance with
CNAS-CL01:2006 (identical to ISO/IEC 17025:2017)
The Certificate Registration Number is L8251

Designation Number: CN1347
Test Firm Registration Number: 894804
Accredited by A2LA, June 14, 2023
The Certificate Registration Number is 6837.01

Accredited by Industry Canada, November 09, 2018
The Conformity Assessment Body Identifier is CN0150
Company Number: 30806

Name of Firm : Shenzhen NCT Testing Technology Co., Ltd.
Site Location : A101&2F B2, Fuqiao 6th Area, Xintian Community, Fuhai Street, Baoan
District, Shenzhen, People's Republic of China

2.4. Measurement Uncertainty

| Parameter | Uncertainty |
|------------------------------------|--------------------------|
| RF output power, conducted | ±1.0dB |
| Power Spectral Density, conducted | ±2.2dB |
| Radio Frequency | ± 1 x 10 ⁻⁶ |
| Bandwidth | ± 1.5 x 10 ⁻⁶ |
| Time | ±2% |
| Duty Cycle | ±2% |
| Temperature | ±1°C |
| Humidity | ±5% |
| DC and low frequency voltages | ±3% |
| Conducted Emissions (150kHz~30MHz) | ±3.64dB |
| Radiated Emission(30MHz~1GHz) | ±5.03dB |
| Radiated Emission(1GHz~25GHz) | ±4.74dB |

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For MPE Measurement

| Used | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|-------------------------------------|-----------------------------------|--------------|-----------|------------|------------|---------------|
| <input checked="" type="checkbox"/> | Exposure Level Tester(1Hz-400KHz) | Narda | EHP-200A | 180ZX00634 | 2023.06.21 | 2024.06.20 |

4. RF EXPOSURE

4.1. Measuring Standard

FCC Part 1(1.1310) and Part 2(2.1091)

4.2. Requirements

Three different categories of transmitters are defined by the FCC in OET Bulletin 65. These categories are fixed installation, mobile, and portable and are defined as follows:

- o Fixed Installations: fixed location means that the device, including its antenna, is physically secured at a permanent location and is not able to be easily moved to another location. Additionally, distance to humans from the antenna is maintained to at least 2 meters.
- o Mobile Devices: a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to be generally used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structures and the body of the user or nearby persons. Transmitters designed to be used by consumers or workers that can be easily re-located, such as a wireless modem operating in a laptop computer, are considered mobile devices if they meet the 20 centimeter separation requirement. The FCC rules for evaluating mobile devices for RF compliance are found in 47 CFR §2.1091.
- o Portable Devices: 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. Portable device requirements are found in Section 2.1093 of the FCC's Rules (47 CFR§2.1093). The FCC also categorizes the use of the device as based upon the user's awareness and ability to exercise control over his or her exposure. The two categories defined are Occupational/ Controlled Exposure and General Population/Uncontrolled Exposure. These two categories are defined as follows:

Occupational/Controlled Exposure: In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means. Awareness of the potential for RF exposure in a workplace or similar environment can be provided through specific training as part of a RF safety program. If appropriate, warning signs and labels can also be used to establish such awareness by providing prominent information on the risk of potential exposure and instructions on methods to minimize such exposure risks.

General Population/Uncontrolled Exposure: The general population / uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

4.3. Test configuration

- 1) The field strength of both E-field and H-field was measured at 15cm(the 15 cm measured from the center of the probe(s) to the edge of the device) using the equipment list above for determining compliance with the MPE requirements of FCC Part 1.1310.
- 2) The RF power density was measured at 3 different charge conditions: min load, mid load, max load.
- 3) Maximum E-field and H-field measurements were made 15cm from each side of the EUT. Along the side of the EUT and still 15cm away from the edge of the EUT, the field probes were positioned at the location where there is maximum field strength. The maximum E-field and H-field is reported below.
- 4) 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. A KDB inquiry is required to determine the applicable exposure limits below 100 kHz.
- 5) This device uses a wireless charging circuit for power transfer operating at the frequency of 325kHz. Thus, the 300kHz limits were used: E-field Limit = 614 (V/m); H-field limit = 1.63 (A/m).

4.4. Limits

(A) Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm ²) | Averaging Time E ² , H ² or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|--|--|
| 0.3-3.0 | 614 | 1.63 | (100)* | 6 |
| 3.0-30 | 1842 / f | 4.89 / f | (900 / f)* | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | | | F/300 | 6 |
| 1500-100,000 | | | 5 | 6 |

(B) Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm ²) | Averaging Time E ² , H ² or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|--|--|
| 0.3-1.34 | 614 | 1.63 | (100)* | 30 |
| 1.34-30 | 824/f | 2.19/f | (180/f)* | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | | | F/1500 | 30 |
| 1500-100,000 | | | 1.0 | 30 |

Note: f = frequency in MHz ; *Plane-wave equivalent power density

| Test Mode | Description | Remark |
|--------------------|--------------|------------|
| Mode A Charging | 1. Full Load | With Phone |
| | 2. Half Load | With Phone |
| | 3. No Load | With Phone |

4.5. Measuring Results

Test Mode: Mode A.1(Full Load)

| Electric Field Emissions | | |
|--------------------------|---------------------|------------|
| Test Position | Measure Value (V/m) | Limit(V/m) |
| Top | 3.32 | 614 |
| Left | 2.16 | 614 |
| Right | 3.52 | 614 |
| Rear | 3.19 | 614 |
| Front | 2.41 | 614 |
| Bottom | 2.65 | 614 |

Magnetic Field Emissions

| Test Position | Measure Value (A/m) | Limit(A/m) |
|---------------|---------------------|------------|
| Top | 0.0226 | 1.63 |
| Left | 0.0365 | 1.63 |
| Right | 0.0118 | 1.63 |
| Rear | 0.0175 | 1.63 |
| Front | 0.0168 | 1.63 |
| Bottom | 0.0098 | 1.63 |

Test Mode: Mode A.2(Half Load)

| Electric Field Emissions | | |
|--------------------------|---------------------|------------|
| Test Position | Measure Value (V/m) | Limit(V/m) |
| Top | 2.62 | 614 |
| Left | 2.53 | 614 |
| Right | 2.41 | 614 |
| Rear | 2.35 | 614 |
| Front | 2.39 | 614 |
| Bottom | 2.14 | 614 |

Magnetic Field Emissions

| Test Position | Measure Value (A/m) | Limit(A/m) |
|---------------|---------------------|------------|
| Top | 0.0218 | 1.63 |
| Left | 0.0209 | 1.63 |
| Right | 0.0137 | 1.63 |
| Rear | 0.0249 | 1.63 |
| Front | 0.0085 | 1.63 |
| Bottom | 0.0097 | 1.63 |

Test Mode: Mode A.3(No Load)

| Electric Field Emissions | | |
|--------------------------|---------------------|------------|
| Test Position | Measure Value (V/m) | Limit(V/m) |
| Top | 1.32 | 614 |
| Left | 1.34 | 614 |
| Right | 1.02 | 614 |
| Rear | 1.06 | 614 |
| Front | 1.28 | 614 |
| Bottom | 1.21 | 614 |

| Magnetic Field Emissions | | |
|--------------------------|---------------------|------------|
| Test Position | Measure Value (A/m) | Limit(A/m) |
| Top | 0.0117 | 1.63 |
| Left | 0.0132 | 1.63 |
| Right | 0.0086 | 1.63 |
| Rear | 0.0045 | 1.63 |
| Front | 0.0096 | 1.63 |
| Bottom | 0.0087 | 1.63 |

Remark: The device meets the mobile RF exposure limit at a 15cm separation distance as specified in §2.1091 of the FCC Rules. The maximum leakage fields at 15 cm surrounding the device from all simultaneous transmitting coils are demonstrated to be less than 30% of the MPE limit.

Requirement for KDB Publication 680106 D01

| Condition Requirement | Yes / No | Description |
|--|----------|--|
| Power transfer frequency is less than 1 MHz. | Yes | The power transfer frequency is 110-205KHz. |
| Output power from each primary coil is less than or equal to 15 watts. | Yes | Output power is 15W Max. |
| The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils. | Yes | The transfer system includes only single primary. |
| Client device is placed directly in contact with the transmitter. | Yes | Client device is placed directly in contact with the transmitter. |
| Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion). | Yes | Mobile exposure conditions only |
| The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit. | Yes | Please refer to the result of Electric Field Emissions and Magnetic Field Emissions. |

5. PHOTOGRAPHS OF TEST SETUP

