

MPE REPORT

For

Quirky, Inc.

Ohm

Model No.: Ohm

Prepared for : Quirky, Inc.
Address : 606 W 28th St Floor 7 New York, NY 10001 United States

Prepared by : SHENZHEN EMTEK CO., LTD.
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Report Number : ES141030380E
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Date of Report : November 05, 2014

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TEST REPORT DESCRIPTION

Applicant : Quirky, Inc.
Manufacturer : Quirky, Inc.
Trade Mark : Quirky
EUT : Ohm
Model No. : Ohm

Measurement Procedure Used:

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

The device described above is tested by SHENZHEN EMTEK 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 EMTEK 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 EMTEK CO., LTD.

Date of Test : October 17, 2014 to November 06, 2014
Prepared by : Yaping Shen
Reviewed : Jack . Li
Approve & Authorized Signer : Lisa 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)	Pass
Note: N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : Ohm

Model Number : Ohm

Test Voltage : AC 120V 60Hz

Output : Coil 1: DC 5V/500mA
Coil 2: DC 5V/1A

Applicant : Quirky, Inc.

Address : 606 W 28th St Floor 7 New York, NY 10001 United States

Manufacturer : Quirky, Inc.

Address : 606 W 28th St Floor 7 New York, NY 10001 United States

Date of Received : October 17, 2014

Date of Test : October 30, 2014 to November 05, 2014

2.2. Description of Test Facility

Site Description

EMC Lab.

: Accredited by CNAS, 2010.10.29
The certificate is valid until 2013.10.28
The Laboratory has been assessed and proved to be in compliance with
CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)
The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2010.5.25
The Laboratory has been assessed according to the requirements
ISO/IEC 17025.

Accredited by FCC, October 28, 2010
The Certificate Registration Number is 709623.

Accredited by Industry Canada, March 5, 2010
The Certificate Registration Number is 4480A-2.

Name of Firm

: SHENZHEN EMTEK CO., LTD.

Site Location

: Bldg 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

2.3. Measurement Uncertainty

Radiated Emission Uncertainty

: 3.3dB (30M~1GHz Polarize: H)
3.2dB (30M~1GHz Polarize: V)
3.7dB (1~18GHz Polarize: H)
3.6dB (1~18GHz Polarize: V)

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"/>	E-Field Probe(100kHz-3G Hz)	Narda	EF0391	2304/03	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	H-Field Probe(300KHz-30 MHz)	Narda	HF3061	245633	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Broadband Field Meter	Narda	NBM-550	232421	May 17, 2014	1 Year

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 10cm 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 10cm from each side of the EUT. Along the side of the EUT and still 10cm 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, This device uses a wireless charging circuit for power transfer operating at the frequency of 112 – 205kHz. 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

4.5. Measuring Results

The device will transmit a low frequency when is it applied a max load. The device will transmit a middle frequency when is it applied a middle load. The device will transmit a high frequency when is it applied a min load.

When operating at single coil mode or twin coil mode, the max current is limit to 500mA for coil 1, the max current is limit to 1000mA for coil 2.

Table 1. E-Field MPE Data(Single Coil 1)

E-Field Measurement (10cm)					
EUT Side	Left(V/m)	Right(V/m)	Top(V/m)	Bottom (V/m)	Z-Axis(above) (V/m)
Min load	1.33	1.07	1.24	0.88	0.94
Mid load	1.08	1.25	1.10	0.97	0.78
Max load	1.24	1.30	1.34	1.47	0.86

Table 2. H-Field MPE Data(Single Coil 1)

E-Field Measurement (10cm)					
EUT Side	Left(A/m)	Right(A/m)	Top(A/m)	Bottom (A/m)	Z-Axis(above) (V/m)
Min load	0.016	0.022	0.038	0.055	0.082
Mid load	0.018	0.016	0.066	0.067	0.074
Max load	0.018	0.039	0.049	0.081	0.090

Table 3. E-Field MPE Data(Single Coil 2)

E-Field Measurement (10cm)					
EUT Side	Left(V/m)	Right(V/m)	Top(V/m)	Bottom (V/m)	Z-Axis(above) (V/m)
Min load	1.12	1.01	1.21	0.56	0.87
Mid load	0.92	0.89	1.01	0.87	0.76
Max load	1.13	0.98	1.09	0.65	0.75

Table 4. H-Field MPE Data(Single Coil 2)

E-Field Measurement (10cm)					
EUT Side	Left(A/m)	Right(A/m)	Top(A/m)	Bottom (A/m)	Z-Axis(above) (V/m)
Min load	0.042	0.039	0.057	0.049	0.081
Mid load	0.051	0.039	0.067	0.059	0.068
Max load	0.037	0.051	0.066	0.069	0.094

Table 5. E-Field MPE Data(Twin Coil)

E-Field Measurement (10cm)					
EUT Side	Left(V/m)	Right(V/m)	Top(V/m)	Bottom (V/m)	Z-Axis(above) (V/m)
Min load	0.88	0.79	1.13	1.04	0.99
Mid load	0.75	0.76	1.25	1.45	0.87
Max load	0.69	0.83	1.69	1.88	0.91

Table 6. H-Field MPE Data(Twin Coil)

E-Field Measurement (10cm)					
EUT Side	Left(A/m)	Right(A/m)	Top(A/m)	Bottom (A/m)	Z-Axis(above) (V/m)
Min load	0.018	0.016	0.035	0.036	0.044
Mid load	0.123	0.056	0.048	0.059	0.057
Max load	0.045	0.045	0.039	0.039	0.056

Remark: The device meets the mobile RF exposure limit at a 10cm separation distance as specified in §2.1091 of the FCC Rules. The maximum leakage fields at 10 cm surrounding the device from all simultaneous transmitting coils are demonstrated to be less than 30% of the MPE limit.

PHOTOGRAPHS OF TEST SETUP

