

# RF Exposure Evaluation Report

**Applicant:** Dongguan KAKA Electronic Technology Co., Ltd.

**Address of Applicant:** No.395, Huanshi East Road, Shitanpu, Tangxia Town, Dongguan, Guangdong, China.

**Equipment Under Test (EUT)**

Product Name: TOOTHBRUSH

Model No.: GF-7

**FCC ID:** 2AV4E-GF-7

**Applicable standards:** FCC CFR Title 47 Part 2 Subpart J Section 2.1091

**Date of sample receipt:** 11 Dec., 2019

**Date of Test:** 12 Dec., to 07 Jan., 2020

**Date of report issue:** 08 Jan., 2020

**Test Result:** PASS\*

Authorized Signature:



Bruce Zhang  
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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## 2 Version

Version No.	Date	Description
00	08 Jan., 2020	Original

**Tested By:**

*Mike.ou*

**Date:**

*08 Jan., 2020*

*Test Engineer*

**Reviewed By:**

*Winner Zhang*

**Date:**

*08 Jan., 2020*

*Project Engineer*

### 3 Contents

	Page
1 COVER PAGE.....	1
2 VERSION .....	2
3 CONTENTS .....	3
4 GENERAL INFORMATION.....	4
CLIENT INFORMATION.....	4
GENERAL DESCRIPTION OF E.U.T.....	4
OPERATING MODES.....	4
DESCRIPTION OF SUPPORT UNITS .....	4
MEASUREMENT UNCERTAINTY.....	4
ADDITIONS TO, DEVIATIONS, OR EXCLUSIONS FROM THE METHOD .....	4
LABORATORY FACILITY .....	5
LABORATORY LOCATION.....	5
TEST INSTRUMENTS LIST .....	5
5 TECHNICAL REQUIREMENTS SPECIFICATION IN FCC CFR TITLE 47 PART 2.1091 .....	6
LIMITS .....	6
TEST SETUP BLOCK.....	6
LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE.....	6
TEST PROCEDURE .....	7
RESULT .....	8
6 TEST SETUP PHOTOS : .....	9

## 4 General Information

### Client Information

Applicant:	Dongguan KAKA Electronic Technology Co., Ltd.
Address of Applicant:	No.395, Huanshi East Road, Shitanpu, Tangxia Town, Dongguan, Guangdong, China.
Manufacturer/Factory:	Dongguan KAKA Electronic Technology Co., Ltd.
Address:	No.395, Huanshi East Road, Shitanpu, Tangxia Town, Dongguan, Guangdong, China

### General Description of E.U.T.

Product Name:	TOOTHBRUSH
Model No.:	GF-7
Operation Frequency:	451.15 kHz~466.55 kHz
Modulation technology:	ASK
Antenna Type:	Coil Antenna
Power supply (Wireless Charger):	Wall hanging: Input: 5V, 0.5A Output: 5V, 0.5A Charging box: Input: 5V, 0.5A Output: 5V, 0.5A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

### Operating Modes

Operating mode	Detail description
Full mode	Keep the EUT in Full mode

### Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
Xiaomi Inc.	Adapter	MDY-03-EB	N/A	N/A

### Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Field Strength (9kHz ~ 30MHz)	±2% (k=2)

### Additions to, deviations, or exclusions from the method

No
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## Laboratory Facility

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

- **FCC- Designation No.: CN1211**

Shenzhen ZhongjianNanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

- **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of Shenzhen ZhongjianNanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen ZhongjianNanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

## Laboratory Location

Shenzhen ZhongjianNanfang Testing Co.,Ltd.

Address: No.B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282, Fax:+86-755-23116366

Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

## Test Instruments list

Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
Magnetic field meter	Narda	ELT-400	B-0138	01-07-2019	01-06-2020

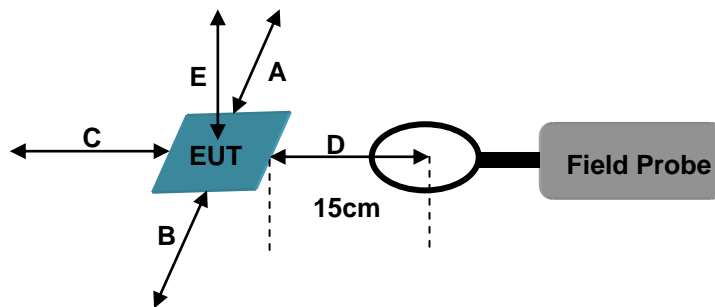
## 5 Technical Requirements Specification in FCC CFR Title 47 Part 2.1091

### Limits

Human exposure to RF emissions from mobile devices (47 CFR §2.1091) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density, as appropriate, since exposures are assumed to occur at distances of 20 cm or more from persons.

According to KDB 680106 D01 RF Exposure Wireless Charging Apps, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm for devices designed for typical desktop applications. E and H field strength measurements or numerical modelling 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.

### Test Setup Block



**Remrak:** The ELT-400 probe antenna diameter is 11cm.

### Limits For General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW /cm <sup>2</sup> )	Averaging Time (minutes)
0.3 ~ 3.0	614	1.63	(100)*	30
3.0 ~ 30	824/f	2.19/f	(180/f <sub>2</sub> )*	30
30 ~ 300	27.5	0.073	0.2	30
300~1500	-	-	f/1500	30
1500~100000	-	-	1.0	30

## Test Procedure

KDB 680106 D01 Section 5(b):

- (1) Power transfer frequency is less than 1 MHz.  
-- Yes, the device operate in the frequency 451.15 kHz~466.55 kHz
- (2) Output power from each primary coil is less than or equal to 15 watts.  
-- Yes, the maximum output power of the primary coil is 2.5W.
- (3) 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 and secondary coils.
- (4) Client device is placed directly in contact with the transmitter.  
-- Yes, client device is placed directly in contact with the transmitter.
- (5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).  
-- Yes, the DUT is a Wireless Charging TOOTHBRUSH.
- (6) 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 the EUT field strength levels are less than 50% of the MPE limit.

1. Turn on the ELT-400 power switch, select the range of 320μT or 80mT (determined according to the actual radiation intensity of DUT), select the peak detection mode, select the Max-Hold display, and select the low sideband range at 30Hz.
2. Measured the ambient noise at this time and record.
3. During the measurement, the magnetic field probe centre of the ELT-400 is kept in 15cm distance from each test surface of the wireless charging base, and recorded the measured values of the A, B, C, D, and E side are separately.
4. After all the measured values of the A, B, C, D, and E side are subtracted the background noise separately, they are the true magnetic field strength values at that point.
5. 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.
6. The required magnetic field strength (unit: A/m) and electric field strength (unit: V/m) can be obtained by the following conversion formula:
  - a)  $A/m = \mu T / 1.25$ ;
  - b)  $dB\mu A/m = 20\lg(A/m) + 120$ ;
  - c)  $dB\mu V/m = dB\mu A/m + 51.5$ ;
  - d)  $V/m = 10^{\{[(dB\mu V/m) - 120]/20\}}$

## Result

Empty load, half load and full load have been tested, the full load mode is the worst, and only the worst test data is reflected in the report.

### a) MagneticFieldStrengthMeasurement

#### Wall hanging:

Measured Side	Distance (cm)	Measured Value (A/m)	50 % of Limit (A/m)	Limit (A/m)
A	15	0.106	0.815	1.63
B	15	0.103	0.815	1.63
C	15	0.098	0.815	1.63
D	15	0.096	0.815	1.63
E	0	0.087	0.815	1.63

Remark: The distance between the E surface and the antenna is greater than 20 cm, so it is close to the test

#### Charging box:

Measured Side	Distance (cm)	Measured Value (A/m)	50 % of Limit (A/m)	Limit (A/m)
A	15	0.136	0.815	1.63
B	0	0.907	0.815	1.63
C	15	0.124	0.815	1.63
D	15	0.119	0.815	1.63
E	20	0.098	0.815	1.63

Remark: The distance between the B surface and the antenna is greater than 15 cm, so it is close to the test



## 6 Test Setup Photos:

Wall hanging



Charging box



-----End of report-----