# FCC RF EXPOSURE EVALUATION REPORT

| | |
|---|---|
| **Product Name:** | Coffee maker |
| **Trade Mark:** | NESCAFE |
| **Model No.:** | 9778 |
| **Report Number:** | 170921037RFC-3 |
| **Test Standards:** | FCC 47 CFR Part 1 Subpart I |
| **FCC ID:** | A679778 |
| **Test Result:** | PASS |
| **Date of Issue:** | October 20, 2017 |

Prepared for:

**WIK Far East Ltd.**
**Unit B, 23/F, 169 Electric Road, North Point, Hong Kong, China**

Prepared by:

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Date: October 20, 2017

UnionTrust Laboratories UnionTrust * Certified *

## Version

| Version No. | Date | Description |
|---|---|---|
| V1.0 | October 20, 2017 | Original |

# CONTENTS

# 1. GENERAL INFORMATION

## 1.1 CLIENT INFORMATION

| | |
|---|---|
| **Applicant:** | WIK Far East Ltd. |
| **Address of Applicant:** | Unit B, 23/F, 169 Electric Road, North Point, Hong Kong, China |
| **Manufacturer:** | WIK Far East Ltd. |
| **Address of Manufacturer:** | Unit B, 23/F, 169 Electric Road, North Point, Hong Kong, China |

## 1.2 EUT INFORMATION

| | | |
|---|---|---|
| **Product Name:** | Coffee maker | |
| **Model No.:** | 9778 | |
| **Add. Model No.:** | N/A | |
| **Trade Mark:** | NESCAFE | |
| **DUT Stage:** | Identical Prototype | |
| **EUT Supports Function:** | 2.4 GHz ISM Band: | IEEE 802.11b/g/n |
| | NFC: | 13.553 MHz to 13.567 MHz |
| **Sample Received Date:** | September 22, 2017 | |
| **Sample Tested Date:** | September 22, 2017 to October 17, 2017 | |

## 1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

| **For 2.4 GHz ISM Band of Wi-Fi** | |
|---|---|
| **Frequency Band:** | 2400 MHz to 2483.5 MHz |
| **Operation Frequency:** | 2412 MHz to 2462 MHz |
| **Support Standards:** | IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20 |
| **Type of Modulation:** | IEEE 802.11b: DSSS(CCK, DQPSK, DBPSK)<br>IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n-HT20: OFDM(64QAM, 16QAM, QPSK, BPSK) |
| **Data Rate:** | IEEE 802.11b: Up to 11 Mbps<br>IEEE 802.11g: Up to 54 Mbps<br>IEEE 802.11n-HT20: Up to MCS7 |
| **Number of Channels:** | IEEE 802.11b: 11<br>IEEE 802.11g: 11<br>IEEE 802.11n-HT20: 11 |
| **Channel Separation:** | 5 MHz |
| **Antenna Type:** | PCB Antenna |
| **Antenna Gain:** | 3.3 dBi |
| **Maximum Conducted Output Power:** | IEEE 802.11b: 19.22 dBm<br>IEEE 802.11g: 19.97 dBm<br>IEEE 802.11n-HT20: 19.63 dBm |

| **For NFC** | |
|---|---|
| **Frequency Band:** | 13.110 MHz to 14.010 MHz |
| **Operation Frequency:** | 13.56 MHz |
| **Data Rate:** | Up to 424 Kbps |
| **Type of Modulation:** | ASK |
| **Antenna Type:** | Loop internal Antenna |
| **Maximum Field Strength:** | 28.2 dBμV/m at 30 meter |

## 1.4 OTHER INFORMATION

None.

## 1.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

**FCC 47 CFR Part 1 Subpart I**

All test items have been performed and recorded as per the above standards

## 1.6 TEST LOCATION

All tests were performed at:

**Shenzhen UnionTrust Quality and Technology Co., Ltd.**

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China 518109
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

## 1.7 TEST FACILITY

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

**CNAS-Lab Code: L9069**
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

**IC-Registration No.: 21600-1**
The 3m Semi-anechoic chamber of Shenzhen UnionTrust Quality and Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 21600-1.

**A2LA-Lab Certificate No.: 4312.01**
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

**FCC Accredited Lab.**
Designation Number: CN1194
Test Firm Registration Number: 259480

## 1.8 DEVIATION FROM STANDARDS

None.

## 1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

## 1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

# 2. EQUIPMENT LIST

Please refer to the RF test report.

# 3. MPE EVALUATION

## 3.1 REFERENCE DOCUMENTS FOR EVALUATION

| No. | Identity | Document Title |
|---|---|---|
| 1 | FCC 47 CFR Part 1 Subpart I | PROCEDURES IMPLEMENTING THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 |
| 2 | KDB 447498 D01 General RF Exposure Guidance v06 | RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES |

## 3.2 MPE COMPLIANCE REQUIREMENT

### 3.2.1 Limits

According to §1.1307(b)(1), system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

**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 Times $\|E\|^2$, $\|H\|^2$ or S (minutes) |
|---|---|---|---|---|
| 0.3-3.0 | 614 | 1.63 | (100)* | 6 |
| 3.0-30 | 1842/f | 4.89/f | ($900/f^2$)* | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | / | / | F/300 | 6 |
| 1500-100000 | / | / | 5 | 6 |

**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 Times $\|E\|^2$, $\|H\|^2$ or S (minutes) |
|---|---|---|---|---|
| 0.3-1.34 | 614 | 1.63 | (100)* | 30 |
| 1.34-30 | 824/f | 2.19/f | ($180/f^2$)* | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | / | / | F/1500 | 30 |
| 1500-100000 | / | / | 1 | 30 |

**Note:** f = frequency in MHz: * = Plane-wave equivalents power density.

### 3.2.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

## 3.3 MPE CALCULATION METHOD

S = PG/4πR^2= EIRP/4πR^2
S = power density (in appropriate units, e.g., mw/cm2)
P = power input to the antenna (in appropriate units, e.g., mw)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.
R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

## 3.4 MPE CALCULATION RESULTS

**Note:** For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

### 3.4.1 For WLAN and NFC

For WiFi function, operating at 2412MHz to 2462 MHz for IEEE802.11b/g/n
For NFC function, operating at 13.110 MHz to 14.010 MHz.

#### 3.4.1.1 Antenna Type:

WiFi: Chain 0: PCB Antenna
NFC: Chain 0: Loop Antenna

#### 3.4.1.2 Antenna Gain:

**WLAN:** 2412MHz to 2462 MHz: 3.3 dBi
**NFC:** 13.56MHz: 0dBi

#### 3.4.1.3 Results for WLAN

| Operating Mode | Freq. | Declared maximum conducted average output power | Max. positive tolerance according manufacturer | Antenna Gain | Calculated maximum EIRP | Declared maximum EIRP | MPE Limit | MPE Value | Pass / Fail |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBm) | | (dBi) | (dBm) | (mW) | ($mw/cm^2$) | | |
| IEEE 802.11b | 2412-2462 | 16.0 | 2.0 | 3.3 | 21.3 | 134.896 | 1 | 0.0268 | PASS |
| IEEE 802.11g | | 15.5 | 2.0 | 3.3 | 20.8 | 120.226 | 1 | 0.0239 | PASS |
| IEEE 802.11n-HT20 | | 14.5 | 2.5 | 3.3 | 20.3 | 107.152 | 1 | 0.0213 | PASS |

#### 3.4.1.4 Results for NFC

| Operating Mode | Freq. | Declared maximum field strength | Max. positive tolerance according manufacturer | Antenna Gain | Calculated maximum field strength | Declared maximum field strength | MPE Limit | MPE Value | Pass / Fail |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBμV/m at 3 meter) | | (dBi) | (dBm) | (mW) | ($mw/cm^2$) | | |
| NFC | 13.56 | 68.2 | 1.0 | 0 | -28.2 | 0.002 | 0.979 | $3.979 \times 10^{-7}$ | PASS |

#### 3.4.1.5 Results for Simultaneous

| Operating Mode | Freq.(MHz) | Max. MPE Value | MPE ratios | Sum | Limit | Pass / Fail |
|---|---|---|---|---|---|---|
| IEEE 802.11b | 2412-2462 | 0.0268 | 0.0268 | 0.0268 | ≤1 | PASS |
| NFC | 13.56 | $3.979 \times 10^{-7}$ | $4.064 \times 10^{-7}$ | | | |

# APPENDIX 1 PHOTOS OF TEST SETUP

N/A

# APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***