# *EVALUATION REPORT*

## *for Certification of Conformity*

## *FCC Part 18(Class Ⅱ Permissive change)*

**Applicant: LG Electronics USA.**

**111 Sylvan Avenue,**

**Englewood Cliffs New Jersey United States 07632,**

**Attn: Daewoong Kim / Director**

**Date of Issue: Jun. 01, 2021**

**Order Number: GETEC-C1-21-289**

**Test Report Number: GETEC-E3-21-015**

**Test Site: GUMI UNIVERSITY EMC CENTER**

**CAB Designation Number: KR0033**

**FCC ID. : BEJD1774NAC**

**Applicant : LG Electronics USA.**

| | |
|---|---|
| **Rule Part(s)** | **: FCC Part 18** |
| **Test Method** | **: FCC/OET MP-5** |
| **Equipment Class** | **: Industrial, Scientific, and Medical equipment** |
| **EUT Type** | **: Household Electric Oven** |
| **Type of Authority** | **: Certification** |
| **Model Name** | **: WCEK6419S** |
| **Trade Name** | **: LG** |

**This equipment has been shown to be in compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC/OET MP-5 (1986)**

**I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the vest of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.**

**Tested by,**

**Sang Hyun Park, Senior Engineer**
**GUMI UNIVERSITY EMC CENTER**

**Reviewed by,**

**Hyoung Seop Kim, Technical Manager**
**GUMI UNIVERSITY EMC CENTER**

## Revision list

| Date | Report No. | Comment | Note. |
|---|---|---|---|
| 2021-06-01 | GETEC-E3-21-015 | Initial | |

# CONTENTS

***Scope:*** *Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and / or unintentional radiators for compliance with technical rules and regulations of the Federal Communications Commission.*

**1. General Information**

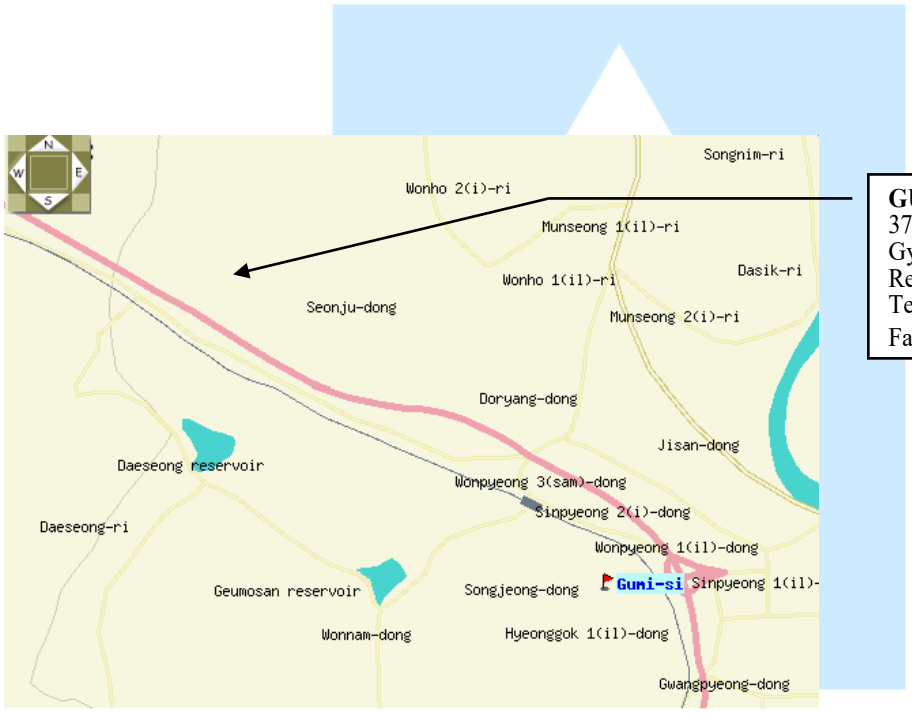
**Applicant: LG Electronics USA.**
**Applicant Address: 111 Sylvan Avenue,**
**Englewood Cliffs New Jersey United States 07632**
**Manufacturer: LG Electronics Inc.**
**Manufacturer Address: 170, Sungsanpaechong-ro, Seongsan-gu, Changwon-si,**
**Gyeongsangnam-di, 51533, Korea**
**Contact Person: Young-Min Kim / Senior Research Engineer**
**Telephone Number: +82-55-260-3966**

- **FCC ID** BEJD1774NAC
- **EUT Type** Household Electric Oven
- **Equipment Class** Industrial, Scientific, and Medical equipment
- **Model Name** WCEK6419S
- **Trade Name** LG
- **Serial Number** Prototype
- **Rule Part(s)** FCC Part 18
- **Type of Authority** Certification
- **Test Procedure(s)** MP-5 (1986)
- **Dates of Test** May 29, 2021 ~ May 30, 2021
- **Place of Test** **GUMI UNIVERSITY EMC CENTER**
(FCC Test Firm Registration Number: 269701)
37 Yaeun-ro, Gumi-si, Gyeongsangbuk-do, 39213, Republic of Korea.
- **Test Report Number** GETEC-E3-21-015
- **Date of Issue** Jun. 01, 2021

## 2. Introduction

The measurement procedure described in FCC methods of measurements of radio noise emissions from industrial, scientific, and medical equipment (MP-5: 1986) was used in determining radiated and conducted emissions emanating from **LG Electronics USA. Household Electric Oven (Model Name: WCEK6419S)**

These measurement tests were conducted at **GUMI UNIVERSITY EMC CENTER**
The site address is 37 Yaeun-ro, Gumi-si, Gyeongsangbuk-do, 39213, Republic of Korea.
This test site is one of the highest point of Gumi UNIVERSITY at about 200 km away from Seoul city and 40 km away from Daegu city. It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures. The detailed description of the measurement facility was found to be in compliance with the requirements of §2.948 according to ANSI C63.4 (2014)

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37 Yaeun-ro, Gumi-si,
Gyeongsangbuk-do, 39213,
Republic of Korea
Tel: +82-54-440-1195
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Fig 1. The map above shows the Gumi UNIVERSITY in vicinity area.

## 3. Product Information

### 3.1 Description of EUT

The Equipment under Test (EUT) is the **LG Electronics USA.**
**Household Electric Oven (Model Name: WCEK6419S) FCC ID.: BEJD1774NAC**

| | | |
|---|---|---|
| 1 | Equipment Class | ISM Consumer Device, Part 18 |
| 2 | Equipment name | Household Electric Oven |
| 3 | Trade mane | LG |
| 4 | Model number | WCEK6419S, Buyer model name-SKSCV3002S |
| 5 | Manufacturer | LG Electronics Inc.<br>170, Seongsanpaechong-Ro, Seongsan-Gu, Changwon-Si, Gyeongsangnam-Do, 51533, Korea |
| 6 | FCC ID | BEJD1774NAC |
| 7 | Serial number &<br>Manufacturer data | Proto type, not provided yet |
| 8 | Date of original grant | NA |
| 9 | Rated RF power output | 950 W |
| 10 | Rated power consumption<br>Microwave mode | 1650 W |
| 11 | Rated current<br>Microwave mode | 14 A |
| 12 | Overall dimensions (inch) | 29-3/4 x 43 7/8 x 24 7/15 (W x H x D) |
| 13 | Cavity dimensions (inch) | Upper MWO 12-11/15 x 8-5/14 x 17-5/16 (W x H x D)<br>Lowe Oven 24-10/19 x 17 7/11 x 19 2/15 (W x H x D) |
| 14 | Cavity volume | Upper MWO 1.7 cu.ft , Lower Oven 4.7cu.ft |
| 15 | Magnetron | 2M246 |
| 16 | Mode of Stirrer | Turntable |
| 17 | Measurement facility | LG |
| 18 | Frequency range in MHz | 2450 ±50 MHz |

- For model name information, refer to ”Appendix J = application letter”

### 3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

| Description | Manufacturer | Model Name | S/N & FCC ID. |
|---|---|---|---|
| None | - | - | S/N: -<br>FCC ID.: - |

***See "Appendix D – Test Setup Photographs" for actual system test set-up***

3.2.2 System configuration

| Description | Manufacturer | Model Name | S/N & FCC ID. |
|---|---|---|---|
| WLAN module | LG Electronics Inc. | LCW-009 | S/N: -<br>FCC ID.: BEJ-LCW009 |

3.2.3 Used Cable(s)

| Cable Name | Condition | Description |
|---|---|---|
| Power cable | Connected to the EUT and AC power source | 1.30 m Unshielded |

### 3.3 Modification Item(s)

- None

## 4. Description of tests

### 4.1 Test Condition

The EUT was operated at maximum (continuous) RF output power. The loads consisted of water in a glass beaker in the amounts specified in the test procedure.
The test conditions of the noted test mode(s) in this test report are;

- Test Voltage / Frequency : AC 120 V / 60 Hz

- Test Mode(s)

  - **Conducted Emission**
    -. Continuous RF output mode with WIFI module operating

  - **Radiated Emission**
    -. Continuous RF output mode with WIFI module operating

### 4.2 Conducted Emission

The Line conducted emission test facility is inside a 4 m × 8 m × 2.5 m shielded enclosure.
(FCC Test Firm Registration No.: 269701)
The EUT was placed on a non-conducting 1.0 m by 1.5 m table, which is 0.4 m in height and 0.8 m away from the vertical wall of the shielded enclosure.
The EUT is powered from the Rohde & Schwarz LISN (ENV216) and the support equipment is powered from the Rohde & Schwarz LISN (ENV216). Powers to the LISN are filtered by high-current high insertion loss power line filter.
Sufficient time for EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.
The RF output of the LISN was connected to the EMI test receiver (Rohde & Schwarz, ESCI).
Exploratory measurements were conducted to identify the highest emission by operating the EUT in a range of typical modes of operation, cable positions, system configuration and arrangement.
Based on exploratory measurements, the final measurements were conducted at the worst test conditions.

Exploratory measurements were scanned using Peak mode of EMI Test receiver from 150 kHz to 30 MHz with 20 ms sweep time. The final measurements were measured with Quasi-Peak and Average mode.
The bandwidth of EMI Test Receiver was set to 9 kHz. Interface cables were connected to the available interface ports of the test unit. Excess cable lengths were bundled at center with 30 cm ~ 40 cm.

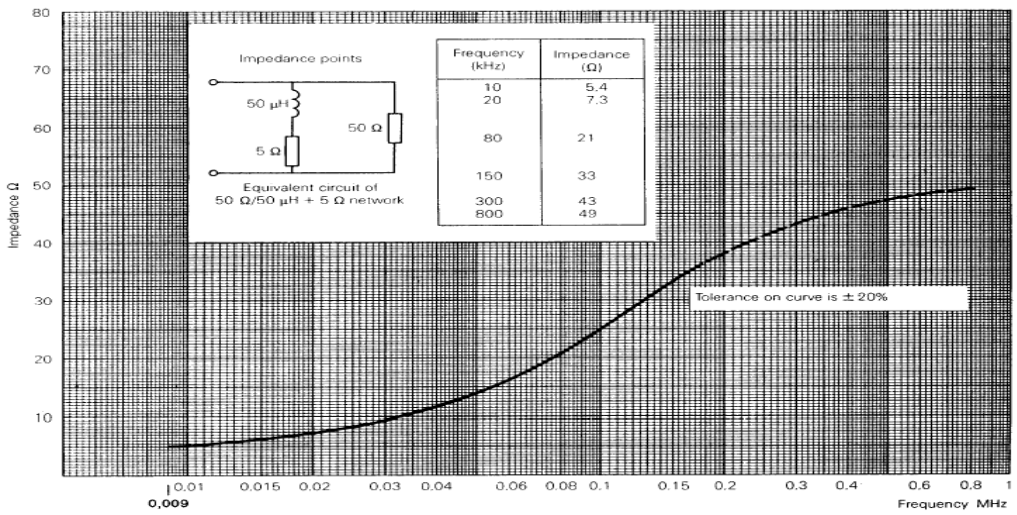



Fig 2. Impedance of LISN

### 4.3 Radiated Emission

Exploratory Radiated measurements were conducted at the 3 m or 10 m semi anechoic chamber in order to identify the highest emission by operating the EUT in a range of typical modes of operation, cable positions, system configuration and arrangement.
Based on exploratory measurements, the final measurements were conducted at the worst test conditions.

Final measurements of below 1 GHz were made at 3 m or 10 m Chamber (FCC Test Firm Registration No.: 269701) or Open area test site (FCC Test Firm Registration No.: 269701) that complies with CISPR 16
Above 1 GHz final measurements were conducted at the 3m Chamber (FCC Test Firm Registration No.: 269701) only.

For measurements above 1GHz, the bottom side of 3 m chamber was installed with absorbers in order to meet SVSWR Limit.
Exploratory measurements were scanned using Peak mode of EMI Test receiver and final measurements were measured with Quasi-Peak mode (Below 1 GHz) and Average mode (Above 1 GHz).

The measurements were performed by rotating the EUT 360° and adjusting the receive antenna height from 1.0 m to 4.0 m. All frequencies were investigated in both horizontal and vertical antenna polarity.

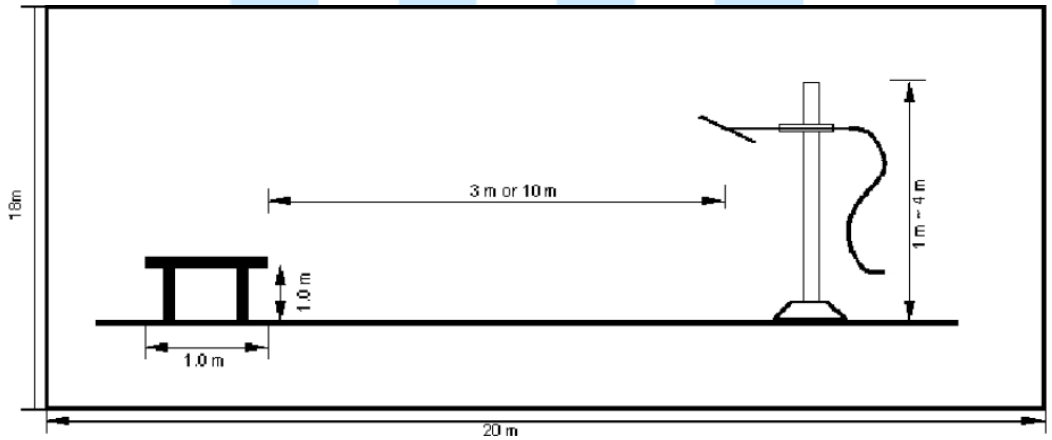



Fig 3. Dimensions of test site (Below 1 GHz)

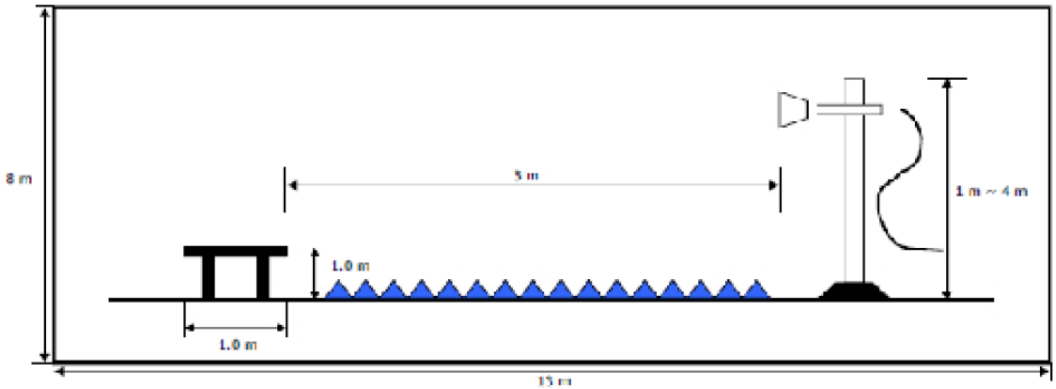



Fig 4. Dimensions of test site (Above 1 GHz)

## 5. Conducted Emission

### 5.1 Operating Environment

Temperature : 24.1 ℃
Relative Humidity : 43.9 % R.H.
Air Pressure : 100.2 kPa

### 5.2 Test Set-up

The conducted emission measurements were performed in the shielded room.
The EUT was placed on wooden table, 0.4 m heights above the floor, 0.8 m from the reference ground plane (GRP) wall and 0.8 m from AMN &ISN.
AMN is bonded on horizontal reference ground plane.
The ground plane, which was electrically bonded to the shield room, ground system and all power lines enter ing the shield room, were filtered.

### 5.3 Measurement Uncertainty

The measurement uncertainty was calculated in accordance with ISO “Guide to the expression of uncertainty in measurement.”
The measurement uncertainty was given with a confidence of 95 %.

| Test Items | Uncertainty | Remark |
|---|---|---|
| Conducted emission (9 kHz ~ 150 kHz) | 3.69 dB | Confidence level of approximately 95 % ($k$ = 2) |
| Conducted emission (150 kHz ~ 30 MHz) | 3.32 dB | Confidence level of approximately 95 % ($k$ = 2) |

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.
The listed uncertainties are the worst case uncertainty for the entire range of measurement. please note that the uncertainty values are provided for informational purposes only are not used in determining the PASS/FAIL results

### 5.4 Limit

| RFI Conducted | FCC Limit(dBµV/m) Class B | |
|---|---|---|
| Freq. Range | Quasi-Peak | Average |
| 150 kHz ~ 0.5 MHz | 66 ~ 56* | 56 ~ 46* |
| 0.5 MHz ~ 5 MHz | 56 | 46 |
| 5 MHz ~ 30 MHz | 60 | 50 |
| *Limits decreases linearly with the logarithm of frequency. | | |

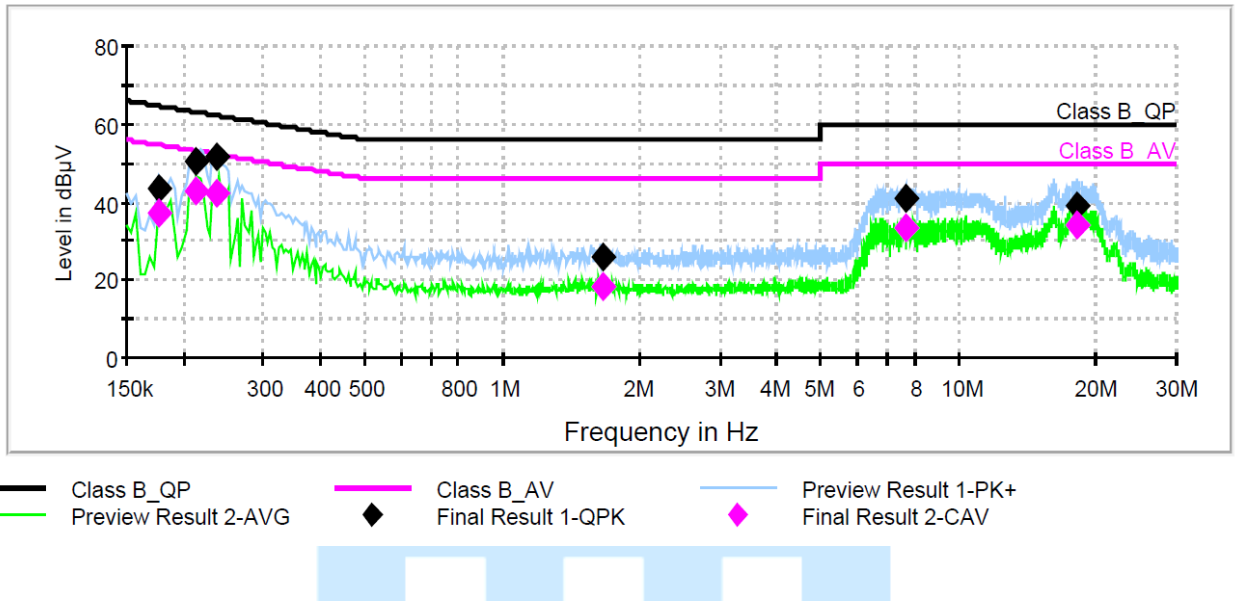
### 5.5 Test Equipment used

| | Model Name | Manufacturer | Description | Serial Number | Calibration Date |
|---|---|---|---|---|---|
| ■ - | ESCI | Rohde & Schwarz | EMI Test Receiver | 100237 | Apr. 08, 2021 |
| ☐ - | ENV216 | Rohde & Schwarz | LISN | 100172 | Apr. 07, 2021 |
| ☐ - | ENV216 | Rohde & Schwarz | LISN | 100173 | Apr. 07, 2021 |
| ■ - | ESH2-Z5 | Rohde & Schwarz | LISN | 829991/009 | Apr. 08, 2021 |
| ■ - | VTSD 9561-D | SCHWARZBECK | Pulse Limiter | 32 | Apr. 08, 2021 |
| ■ - | EMC 32 | Rohde & Schwarz | Software | Ver.8.53 | N/A |

### 5.6 Test data for Conducted Emission

-. Test Date : May 29, 2021
-. Resolution Bandwidth : 9 kHz
-. Frequency Range : 0.15 MHz ~ 30 MHz
-. Line : L1: Live, N: Neutral

▪ Operating condition: Continuous RF output mode




**Final Result 1**

| Frequency (MHz) | QuasiPeak (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|---|---|---|---|---|---|---|---|---|---|
| 0.177539 | 43.8 | 1000.0 | 9.000 | GND | N | 20.5 | 20.8 | 64.6 | |
| 0.212680 | 50.5 | 1000.0 | 9.000 | GND | L1 | 20.5 | 12.6 | 63.1 | |
| 0.236400 | 51.7 | 1000.0 | 9.000 | GND | L1 | 20.5 | 10.5 | 62.2 | |
| 1.660962 | 25.8 | 1000.0 | 9.000 | GND | N | 20.6 | 30.2 | 56.0 | |
| 7.639231 | 41.0 | 1000.0 | 9.000 | GND | N | 20.8 | 19.0 | 60.0 | |
| 18.253831 | 39.4 | 1000.0 | 9.000 | GND | L1 | 21.0 | 20.6 | 60.0 | |

**Final Result 2**

| Frequency (MHz) | CAverage (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|---|---|---|---|---|---|---|---|---|---|
| 0.177539 | 37.0 | 1000.0 | 9.000 | GND | N | 20.5 | 17.6 | 54.6 | |
| 0.212680 | 42.6 | 1000.0 | 9.000 | GND | L1 | 20.5 | 10.5 | 53.1 | |
| 0.236400 | 41.9 | 1000.0 | 9.000 | GND | L1 | 20.5 | 10.3 | 52.2 | |
| 1.660962 | 18.4 | 1000.0 | 9.000 | GND | N | 20.6 | 27.6 | 46.0 | |
| 7.639231 | 33.3 | 1000.0 | 9.000 | GND | N | 20.8 | 16.7 | 50.0 | |
| 18.253831 | 33.9 | 1000.0 | 9.000 | GND | L1 | 21.0 | 16.1 | 50.0 | |

**< Fig 5. Graph of continuous disturbance >**

## 6. Radiated Emission

### 6.1 Operating Environment

| | | |
|---|---|---|
| Temperature | : | 21.9 ℃ |
| Relative Humidity | : | 45.6 % R.H. |
| Air Pressure | : | 100.2 kPa |

### 6.2 Test Set-up

A preliminary and final measurement was at 3 m & 10 m anechoic chamber.
The EUT was placed on a non-conductive turntable approximately 1.0 m above the ground plane.
The turntable with EUT was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels.
This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

### 6.3 Measurement Uncertainty

The measurement uncertainty was calculated in accordance with ISO “Guide to the expression of uncertainty in measurement”.

The measurement uncertainty was given with a confidence of 95 %.

| Test Items(3 m Anechoic Chamber) | Uncertainty | Remark |
|---|---|---|
| Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical) | 4.78 dB | Confidence level of approximately 95 % ($k$ = 2) |
| Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal) | 4.77 dB | Confidence level of approximately 95 % ($k$ = 2) |
| Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical) | 6.20 dB | Confidence level of approximately 95 % ($k$ = 2) |
| Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal) | 5.12 dB | Confidence level of approximately 95 % ($k$ = 2) |
| Radiated emission (1 000 MHz ~ 6 000 MHz, 3 m) | 4.56 dB | Confidence level of approximately 95 % ($k$ = 2) |
| Radiated emission (6 000 MHz ~ 18 000 MHz, 3 m) | 4.88 dB | Confidence level of approximately 95 % ($k$ = 2) |
| Radiated emission (18 000 MHz ~ 26 000 MHz, 3 m) | 5.04 dB | Confidence level of approximately 95 % ($k$ = 2) |
| Test Items(10 m Anechoic Chamber) | Uncertainty | Remark |
| Radiated emission (30 MHz ~ 300 MHz, 10 m, Vertical) | 4.76 dB | Confidence level of approximately 95 % (k = 2) |
| Radiated emission (30 MHz ~ 300 MHz, 10 m, Horizontal) | 4.78 dB | Confidence level of approximately 95 % (k = 2) |
| Radiated emission (300 MHz ~ 1 000 MHz,10 m, Vertical) | 4.87 dB | Confidence level of approximately 95 % (k = 2) |
| Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Horizontal) | 4.85 dB | Confidence level of approximately 95 % (k = 2) |
| Radiated emission (1 000 MHz ~ 6 000 MHz, 3 m) | 4.64 dB | Confidence level of approximately 95 % ($k$ = 2) |
| Radiated emission (6 000 MHz ~ 18 000 MHz, 3 m) | 4.95 dB | Confidence level of approximately 95 % ($k$ = 2) |

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

The listed uncertainties are the worst case uncertainty for the entire range of measurement. please note that the uncertainty values are provided for informational purposes only are not used in determining the PASS/FAIL results

**6.4 Limit**

| Equipment | Operating frequency | RF Power generated by equipment (watts) | Field strength limit (uV/m) | Distance (meters) |
|---|---|---|---|---|
| Any type unless otherwise specified (miscellaneous) | Any ISM frequency | Below 500<br>500 or more | 25<br>25×SQRT(power/500) | 300<br>[1]300 |
| | Any non-ISM frequency | Below 500<br>500 or more | 15<br>15×SQRT(power/500) | 300<br>[1]300 |
| Industrial heaters and RF stabilized arc welders | On or below 5,725 MHz<br>Above 5,725 MHz | Any<br>Any | 10<br>(2) | 1,600<br>(2) |
| Medical diathermy | Any ISM frequency<br>Any non-ISM frequency | Any<br>Any | 25<br>15 | 300<br>300 |
| Ultrasonic | Below 490 kHz | Below 500<br>500 or more | 2,400/F(kHz)<br>2,400/F(kHz)× SQRT (power/500) | 300<br>[3]300 |
| | 490 to 1,600 kHz<br>Above 1,600 kHz | Any<br>Any | 24,000/F(kHz)<br>15 | 30<br>30 |
| Induction cooking ranges | Below 90 kHz<br>On or above 90 kHz | Any<br>Any | 1,500<br>300 | [4]30<br>[4]30 |

Notes:
* Limit (at 300 m) = 25 * (RF Power/500) 1/2 [μV/m]
* Field Strength below 1,000 MHz (at 300 m) [μV/m] = 10 [(Field strength at 10m(dBuV/m)-29.5)/20]
* Field Strength above 1,000 MHz (at 300 m) [μV/m] = K * 10 [Field strength at 3m(dBuV/m)/20]

### 6.5 Test Equipment used

| | Model Name | Manufacturer | Description | Serial Number | Calibration Date |
|---|---|---|---|---|---|
| ■ - | ESU40 | Rohde & Schwarz | EMI Test Receiver | 100266 | Apr. 08, 2021 |
| ■ - | BBHA9120D | Schwarzbeck | Horn ANT | 207 | Sep. 15, 2021 |
| ■ - | BBHA9170 | Schwarzbeck | Horn ANT | 766 | Nov. 18, 2020 |
| ■ - | MCU066 | maturo GmbH | Position Controller | 1390306 | N/A |
| ■ - | CO3000 | Innco system GmbH | Position Controller | CO3000/1084/4 2760218/P | N/A |
| ■ - | TT2.5SI | maturo GmbH | Turntable | 1390307 | N/A |
| ■ - | MA4640-XP-ET | HD GmbH | Antenna Mast | MA4640/558 | N/A |
| ■ - | TK-PA18H | Testek | Low Noise Amplifier | 180001-L | Apr. 09, 2021 |
| ■ - | TK-PA1840H | Testek | Preamplifier | 170007-L | Apr. 09, 2021 |
| ■ - | WHKX3.0/18G-10SS | WAINWRIGHT INSTRUMENTS | High pass filter | SN31 | Apr. 07, 2021 |
| ■ - | EMC 32 | Rohde & Schwarz | Software | Ver 10.40.10 | N/A |
| ■ - | ESR7 | Rohde & Schwarz | EMI Test Receiver | 101382 | Apr. 08, 2021 |
| ■ - | VULB9160 | Schwarzbeck | Broad Band Test Antenna | 3099 | Oct. 09, 2021 |
| ■ - | TK-PA06S | Testek | Low Noise Amplifier | 170038-L | Apr. 09, 2021 |
| ■ - | CO3000 | Innco system GmbH | Position Controller | CO03000/779/ 33050314/L | N/A |
| ■ - | DT3000 | Innco system GmbH | Turntable | 1280314 | N/A |
| ■ - | MA4000-EP | Innco system GmbH | Antenna Mast | 4420314 | N/A |
| □ - | 310N | Sonoma instrument | amplifier | 1871164 | Apr. 09, 2021 |
| ■ - | EMC 32 | Rohde & Schwarz | Software | Ver 10.50.10 | N/A |

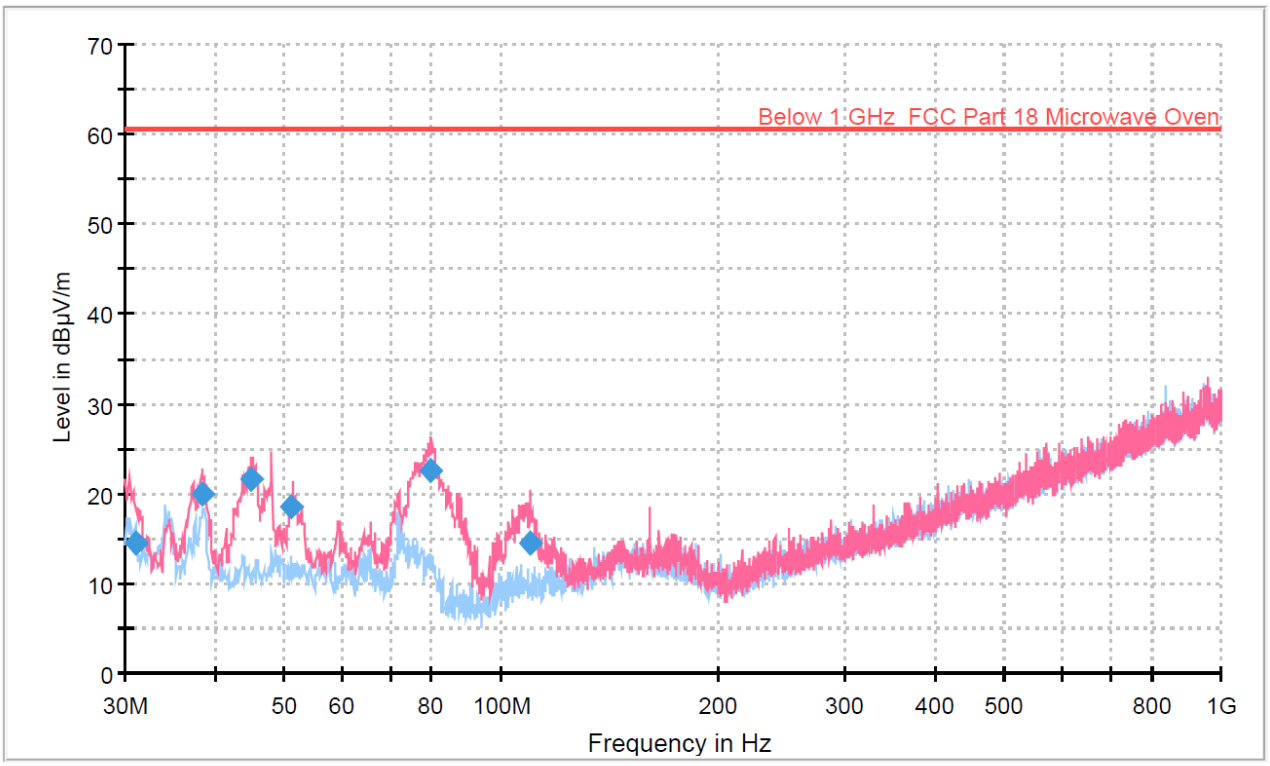
### 6.6 Test data for Radiated Emission

-. Test Date : May 29. 2021~ May 30, 2021
-. Measurement Distance : 3 m, 10 m
-. Note : -

-. Measurement

| Frequency range | 30 MHz ~ 1 GHz @ 10 m | Above 1 GHz @ 3m |
|---|---|---|
| Detector mode | Average | Average |
| Resolution bandwidth | 120 kHz | 1 MHz |

-. 30 MHz ~ 1 GHz




## Final_Result

| Frequency (MHz) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|
| 31.181 | 14.58 | 60.62 | 46.04 | 1000.0 | 120.000 | 105.0 | V | 101.0 | -28 |
| 38.495 | 20.01 | 60.62 | 40.61 | 1000.0 | 120.000 | 108.0 | V | 257.0 | -29 |
| 45.035 | 21.64 | 60.62 | 38.98 | 1000.0 | 120.000 | 100.0 | V | -27.0 | -28 |
| 51.194 | 18.55 | 60.62 | 42.07 | 1000.0 | 120.000 | 380.0 | V | 140.0 | -28 |
| 80.005 | 22.52 | 60.62 | 38.10 | 1000.0 | 120.000 | 125.0 | V | -17.0 | -32 |
| 109.374 | 14.46 | 60.62 | 46.16 | 1000.0 | 120.000 | 100.0 | V | 86.0 | -29 |

**< Fig 6. Radiated emission result (30 MHz ~ 1 000 MHz) >**

**-.** 1 GHz ~ 26 GHz

| Freq [GHz] | Pol. | Load [mL] | Load Location | Reading [dBµV] | Limit [dBµV/m] @ 3m | Margin [dB] | Height (CM) | Azimuth | Corr (dB/m) |
|---|---|---|---|---|---|---|---|---|---|
| 1.237 | V | 300 | Center | 66.46 | 71.08 | 4.62 | 130 | 30 | 29.92 |
| 2.516 | V | 300 | Center | 65.82 | 71.08 | 5.26 | 100 | 0 | 34.56 |
| 8.384 | H | 300 | Center | 60.28 | 71.08 | 10.80 | 160 | 60 | 0.46 |
| 11.052 | V | 700 | Center | 60.57 | 71.08 | 10.51 | 120 | 330 | 8.12 |
| 19.607 | H | 300 | Front | 63.12 | 71.08 | 7.96 | 110 | 120 | 24.81 |
| 19.702 | V | 700 | Front | 59.44 | 71.08 | 11.64 | 100 | 30 | 24.94 |

Notes:

1) Load for measurement of radiation on second and third harmonic: Two loads, one of 700 and the other of 300 mL, of water were used. Each load was tested both with the beaker located in the center of the oven and with it in the corner.

2) Load for all other measurements: 700 mL of water, with the beaker located in the center of the oven.

3) The tests were made with average detector for frequency range of 1 GHz to 26 GHz.

## 7. Input Power

### 7.1 Operating Environment

Temperature : 24.0 ℃
Relative Humidity : 46.1 % R.H.
Air Pressure : 100.2 kPa

### 7.2 Test Set-up

Input power and current were measured using a power analyzer.
A 700 ml water load was placed in the center of the oven and the oven set to maximum power.
A 700 ml water load was chosen for its compatibility.
Manufacturers to determine their input ratings commonly use the procedure.

### 7.3 Test Equipment used

| Model Name | Manufacturer | Description | Serial Number | Calibration Date |
|---|---|---|---|---|
| ■ - 360AMX | Pacific | AC power source | 0438 | Apr. 09, 2021 |
| ■ - PPA5511 | N4L | Precision Power analyzer | 162-05554 | Apr. 19, 2021 |
| ■ - IEC555 | VOLTECH | Impedance Network | 5016 | Apr. 20, 2021 |

### 7.4 Test data for Input Power

-. Test Date : May 29, 2021
-. Test condition : Continuous RF output mode (Load: 700 mL)

-. Measurement

| Mode | Input Voltage | Current [A] | Power Consumption [W] | Manufacturer Rating [A] |
|---|---|---|---|---|
| Microwave | AC 120 V, 60 Hz | 15.45 | 1 753 | 14.0 |

## 8. RF Power Output Measurement according to MP-5

### 8.1 Operating Environment

| | | |
|---|---|---|
| Temperature | : | 24.1 ℃ |
| Relative Humidity | : | 46.4 % R.H. |
| Air Pressure | : | 100.2 kPa |

### 8.2 Test Set-up

The Calorimetric Method was used to determine maximum output power. A 1 000 mL water load was placed in the center of the oven. A mercury thermometer was used to measure temperature rise. The test method was described in MP-5

### 8.3 Test Equipment used

| | Model Name | Manufacturer | Description | Serial Number | Calibration Date |
|---|---|---|---|---|---|
| ■ - | 360AMX | Pacific | AC power source | 0438 | Apr. 09, 2021 |
| ■ - | PPA5511 | N4L | Precision Power analyzer | 162-05554 | Apr. 19, 2021 |
| ■ - | IEC555 | VOLTECH | Impedance Network | 5016 | Apr. 20, 2021 |

### 8.4 Test data for RF Power Output Measurement according to MP-5

-. Test Date : May 29, 2021
-. Test condition : Continuous RF output mode (Load: 1 000 mL)

-. Measurement

$$\text{Power [W]} = \frac{(4.187\ \text{Joules/Cal}) \times (\text{Volume in mL}) \times (\text{Temperature Rise})}{\text{Time in Seconds}}$$

| Quantity of Water | Starting Temperature | Final Temperature | Elapsed Time |
|---|---|---|---|
| 1 000 mL | 21.4 ℃ | 50.8 ℃ | 120 Sec |

$$\text{Power [W]} = \frac{4.187 \times 1\,000 \times 29.4}{120}$$

Power [W] = 1 025.8 Watts

## 9. Frequency Measurement

### 9.1 Operating Environment

Temperature : 22.2 ℃
Relative Humidity : 51.6 % R.H.
Air Pressure : 100.2 kPa

### 9.2 Test Equipment used

| | Model Name | Manufacturer | Description | Serial Number | Calibration Date |
|---|---|---|---|---|---|
| ■ - | ESU40 | Rohde & Schwarz | EMI Test Receiver | 100266 | Apr. 08, 2021 |
| ■ - | BBHA9120D | Schwarzbeck | Horn ANT | 207 | Sep. 15, 2021 |
| ■ - | MCU066 | maturo GmbH | Position Controller | 1390306 | N/A |
| ■ - | TT2.5SI | maturo GmbH | Turntable | 1390307 | N/A |
| ■ - | MA4640-XP-ET | HD GmbH | Antenna Mast | MA4640/558 | N/A |
| ■ - | TK-PA18H | Testek | Low Noise Amplifier | 180001-L | Apr. 09, 2021 |
| ■ - | CO3000 | Innco system GmbH | Position Controller | CO3000/1084/4 2760218/P | N/A |

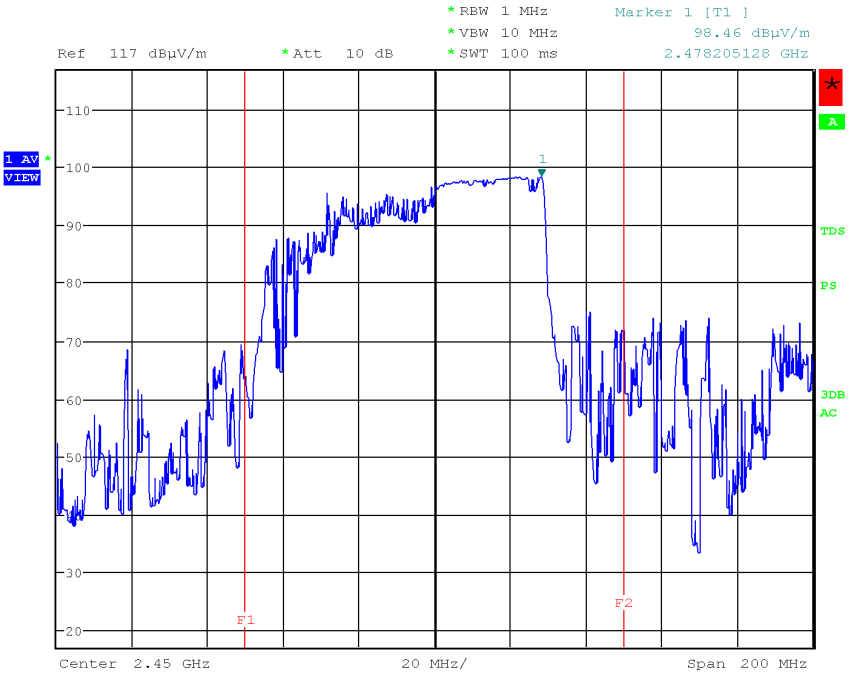
### 9.3 Test data for Frequency Measurement

9.3.1 Line Voltage Variation Test

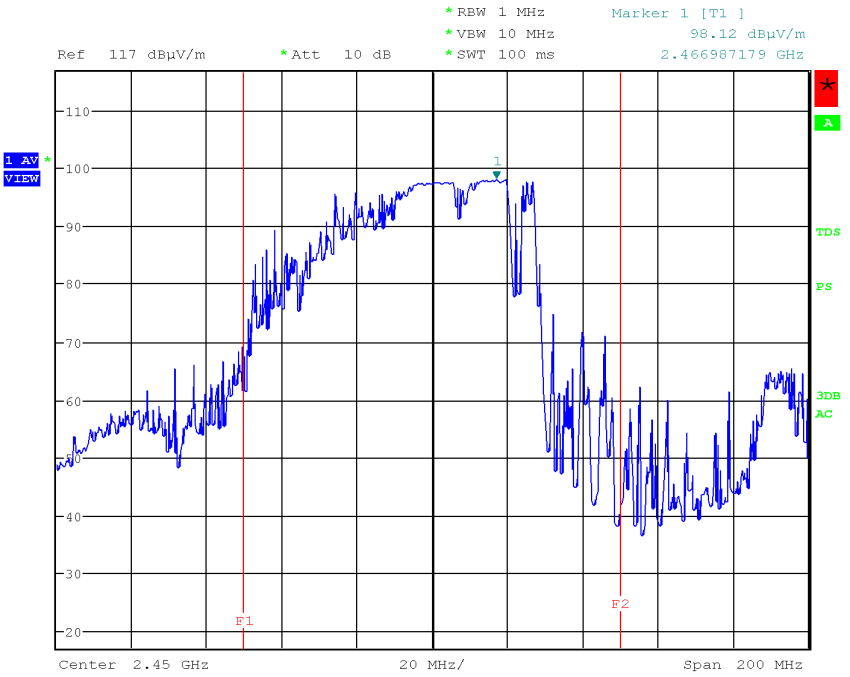
-. Test Date : May 29, 2021
-. Test condition : Continuous RF output mode
-. Test Voltage : AC 96 V, 60 Hz to AC 150 V, 60 Hz
-. Load : 1 000 mL
-. Fundamental Frequency : 2 450 MHz
-. Limit : 2.4 GHz < f < 2.5 GHz
-. Measurement : Maximum Frequency Observed – 2. 478 GHz
Minimum Frequency Observed – 2.466 GHz

| Voltage variation (a.c. V) | Pol | Frequency ( MHz ) | Allowed Tolerance for the ISM Band |
|---|---|---|---|
| 96 | H | 2 466 | Lower : 2 400 MHz<br>Upper : 2 500 MHz |
| | V | 2 469 | |
| 108 | H | 2 474 | |
| | V | 2 475 | |
| 120 | H | 2 472 | |
| | V | 2 472 | |
| 132 | H | 2 472 | |
| | V | 2 478 | |
| 150 | H | 2 474 | |
| | V | 2 476 | |

Note* Pol. H= Horizontal, V=Vertical




**< Fig 7. Frequency Measurements _ Voltage (Maximum Frequency Observed: 2.478 GHz) >**



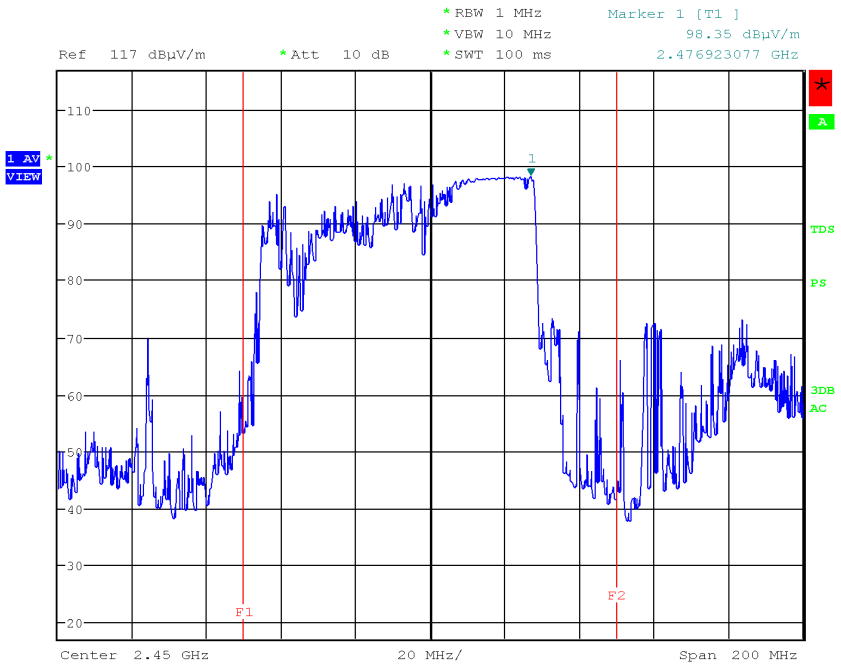

**< Fig 8. Frequency Measurements _Voltage (Minimum Frequency Observed: 2.466 GHz) >**

9.3.2 Load Variation Test

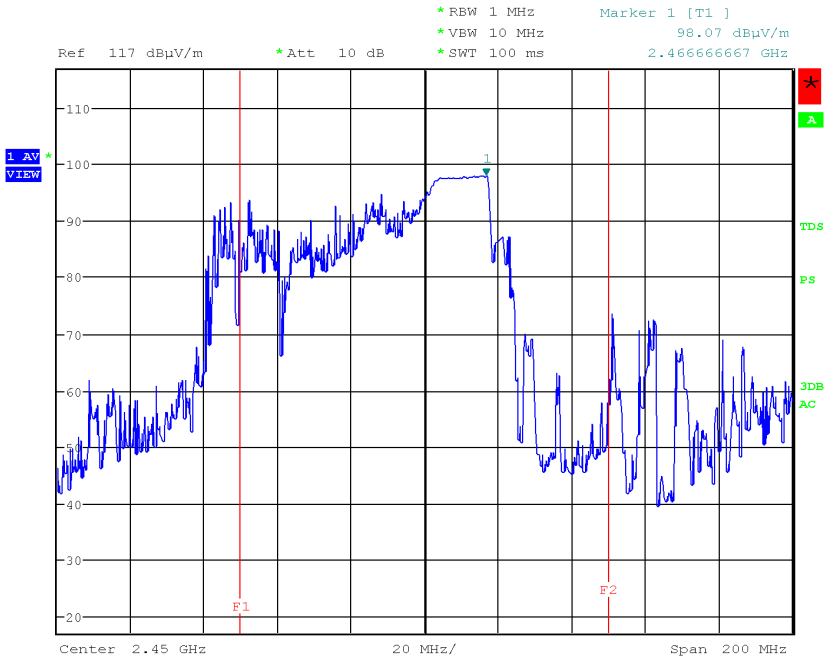
-. Test Date : May 29, 2021
-. Test condition : Continuous RF output mode
-. Test Voltage : AC 120 V, 60 Hz
-. Initial Load : 1 000 mL
-. Final Load : 200 mL
-. Fundamental Frequency : 2 450 MHz
-. Limit : 2.4 GHz < f < 2.5 GHz
-. Measurement : Maximum Frequency Observed – 2.476 GHz
Minimum Frequency Observed – 2.466 GHz

| Volume of water (ml) | Pol | Frequency ( MHz ) | Allowed Tolerance for the ISM Band |
|---|---|---|---|
| 200 | H | 2 476 | Lower : 2 400 MHz<br>Upper : 2 500 MHz |
| | V | 2 472 | |
| 400 | H | 2 466 | |
| | V | 2 469 | |
| 600 | H | 2 470 | |
| | V | 2 471 | |
| 800 | H | 2 470 | |
| | V | 2 472 | |
| 1 000 | H | 2 472 | |
| | V | 2 470 | |

Note
* Pol. H= Horizontal, V=Vertical




**< Fig 9. Frequency Measurements _Load (Maximum Frequency Observed: 2.476 GHz) >**




**< Fig 10. Frequency Measurements _Load (Minimum Frequency Observed: 2.466 GHz) >**

## 10. Power Density Safety Check

### 10.1 Test Set-up

The power density was check to ensure that the power is not greater than 1.0 mW/cm$^2$ at any location of the oven. The 1.0 mW/cm$^2$ is in accordance with CDRH and UL923 standard.
***A microwave survey meter was placed on all sides, door and viewing, bottom, top and rear.***
***The leakage microwave and did not exceed the specified limits.***

### 10.2 Test Equipment used

| | Model Name | Manufacturer | Description | Serial Number | Calibration Date |
|---|---|---|---|---|---|
| ■ - | FJZ005HA | Holaday Industries Inc. | Microwave Survey Meter | 224011 | Jun. 17, 2020 |

### 10.3 Test data for Power Density Safety Check

-. Test date: May 26, 2021
-. Measurement

Maximum Leakage Microwave Observed: 0.20 mW/cm$^2$

## 11. Sample Calculations

$$dB\mu V = 20 \text{ Log } {}_{10}(\mu V/m)$$
$$dB\mu V = dBm + 107$$
$$\mu V = 10^{(dB\mu V/20)}$$

### 11.1 Example 1 :

■ 20.3 MHz

Class B Limit = 250 µV = 48 dBµV

Reading = 39.2 dBµV

$10^{(39.2dB\mu V/20)}$ = 91.2 µV

Margin = 48 dBµV - 39.2 dBµV

= 8.8 dB

### 11.2 Example 2 :

■ 66.7 MHz

Class B Limit = 100 µV/m = 40.0 dBµV/m

Reading = 31.0 dBµV

Antenna Factor + Cable Loss = 5.8 dB

Total = 36.8 dBµV/m

Margin = 40.0 dBµV/m – 36.8 dBµV/m

= 3.2 dB

## 12. Recommendation & Conclusion

The data collected shows that the **LG Electronics USA. Household Electric Oven(Model Name: WCEK6419S)** was complies with §18.305, 18.307, 18.309 and 18.311 of the FCC Rules.

**- The end -**