

EVALUATION REPORT

for Certification of Conformity

FCC Part 18

Applicant: LG Electronics USA, Inc.
111 Sylvan Avenue North Building
Englewood Cliffs New Jersey United States 07632,
Attn: Heejae Cho / Director

Date of Issue: Jun. 20, 2023
Order Number: GETEC-C1-23-397
Test Report Number: GETEC-E3-23-041-R1
Test Site: GUMI UNIVERSITY EMC CENTER
CAB Designation Number: KR0033

FCC ID. : BEJD1724NAF

Applicant : LG Electronics USA, Inc.

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
Basic Model Name	: WCEP6423D
Added Model Name	: WCEP6423F
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,



Reviewed by,



Tak Dong Kim, Engineer
GUMI UNIVERSITY EMC CENTER

Hyun Kim, Technical Manager
GUMI UNIVERSITY EMC CENTER



Revision list

Test Report No.	Issue Date	Description
GETEC-E3-23-041	May. 31, 2023	Initial
GETEC-E3-23-041-R1	Jun. 20, 2023	Add model name by customer request. Model Name: WCEP6423F

※ This test report is not related to the accredited test result by ISO/IEC 17025 and KOLAS





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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, Inc.

Applicant Address: 111 Sylvan Avenue North Building

Englewood Cliffs New Jersey United States 07632

Manufacturer: LG Electronics Inc.

Manufacturer Address: 170, Sungsanpaechong-ro, Seongsan-gu, Changwon-si,

Gyeongsangnam-do 51533, Korea

Contact Person: Heejae Cho / Director

Telephone Number: 201-266-2215

● FCC ID	BEJD1724NAF
● EUT Type	HOUSEHOLD ELECTRIC OVEN
● Equipment Class	Industrial, Scientific, and Medical equipment
● Model Name	WCEP6423D
● 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 22, 2023 ~ May 25, 2023
● 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-E3-23-041-R1
● Date of Issue	Jun. 20, 2023



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 **HOUSEHOLD ELECTRIC OVEN (Model Name: WCEP6423D)**

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)

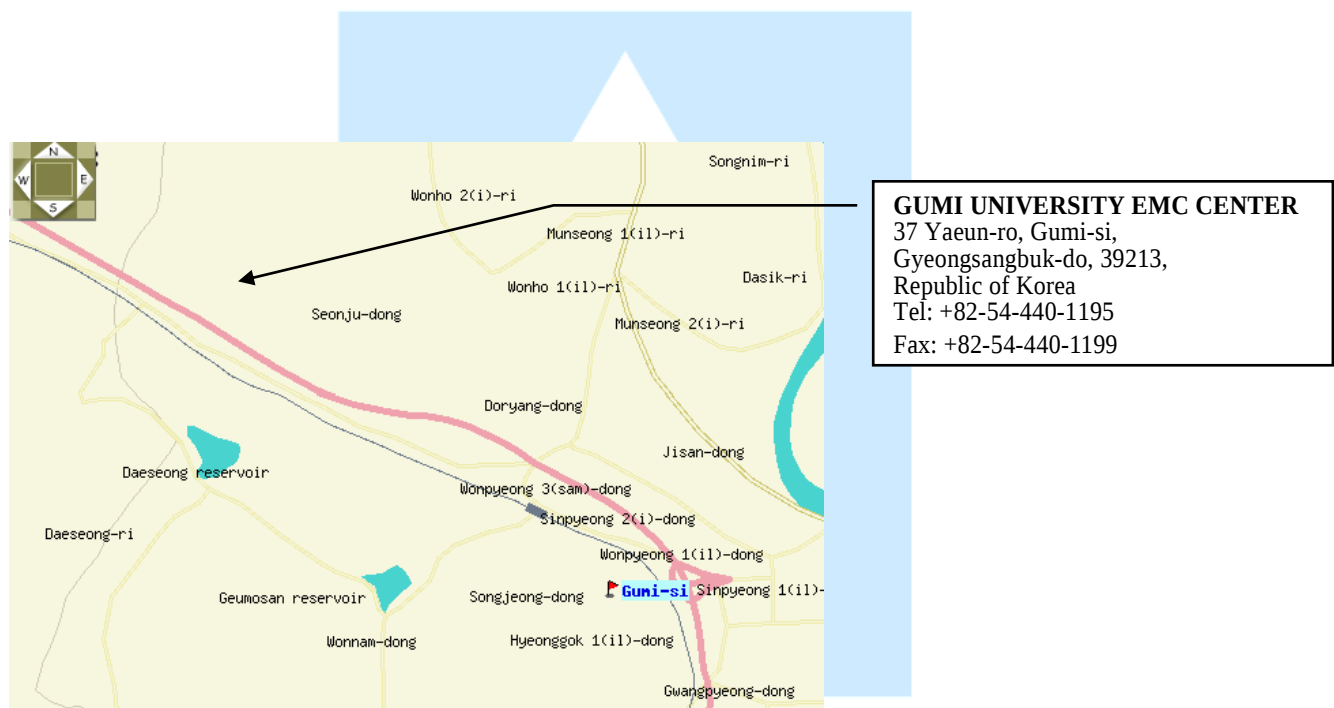


Fig 1. The map above shows the Gumi UNIVERSITY in vicinity area.



3. Product Information

3.1 Description of EUT

The Equipment under Test (EUT) is the **HOUSEHOLD ELECTRIC OVEN (Model Name: WCEP6423D)**
FCC ID.: BEJD1724NAF

1	Equipment Class	ISM Consumer Device, Part 18
2	Equipment name	HOUSEHOLD ELECTRIC OVEN
3	Trade name	LG
4	Model number	WCEP6423D
5	Added Model Name	WCEP6423F
6	Manufacturer	LG Electronics Inc. 170, Seongsanpaechong-Ro, Seongsan-Gu, Changwon-Si, Gyeongsangnam-Do, 51533, Korea
7	FCC ID	BEJD1724NAF
8	Serial number & Manufacturer data	Proto type, not provided yet
9	Date of original grant	NA
10	Rated RF power output	975 W
11	Rated power consumption Microwave mode	1650 W
12	Rated current Microwave mode	14 A
13	Overall dimensions (inch)	29-3/4 x 43 7/8 x 24 7/15 (W x H x D)
14	Cavity dimensions (inch)	Upper MWO 20-3/4 x 8-3/8 x 17-3/8 (W x H x D) Lower Oven 24-1/2 x 17-5/8 x 18-7/8 (W x H x D)
15	Cavity volume	Upper MWO 1.7 cu.ft , Lower Oven 4.7cu.ft
16	Magnetron	2M246
17	Magnetron Manufacturer	LG Electronics Inc.
18	Mode of Stirrer	Turntable
19	Measurement facility	LG
20	Frequency range in MHz	2450 ±50 MHz



3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID.
None	-	-	S/N: - 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.	LCWB-001	S/N: - FCC ID.: BEJ-LCWB001

3.2.3 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the EUT and AC power source	1.60 m Unshielded

3.3 Modification Item(s)

- None

3.4 Identification of EUT(s)

See the table below for other changes.

Basic Model name	WCEP6423D	Product Color: Black
Added Model name	WCEP6423F	Product Color: Stainless

("These model names are given in accordance with manufacture's seller model name and customer's requirements that are not effect on EMC performance. All the electrical characteristics are the same as basic model.")



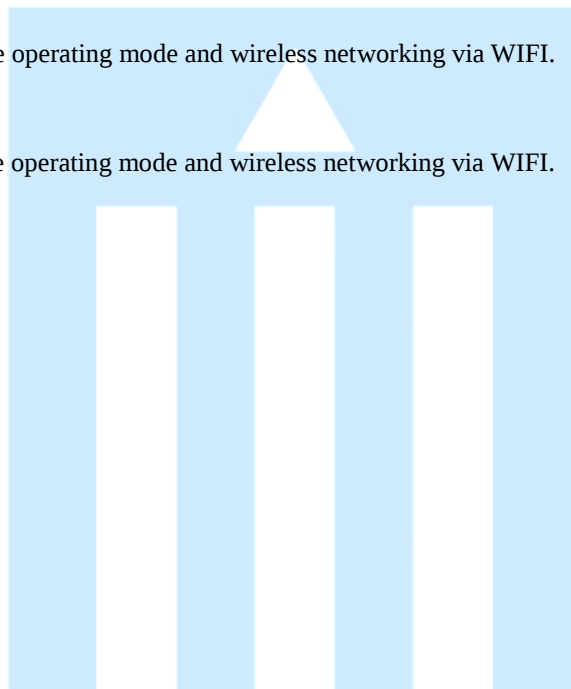
4. Description of tests

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 microwave operating mode and wireless networking via WIFI.
 - **Radiated Emission**
 - Continuous microwave operating mode and wireless networking via WIFI.





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 and the support equipment is powered from the Rohde & Schwarz LISN. 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.

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.

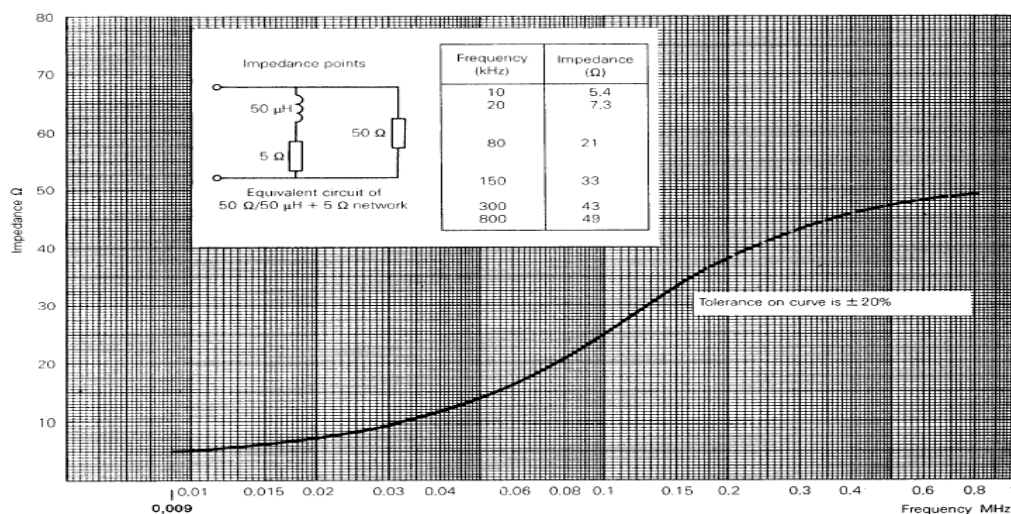


Fig 2. Impedance of LISN



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.

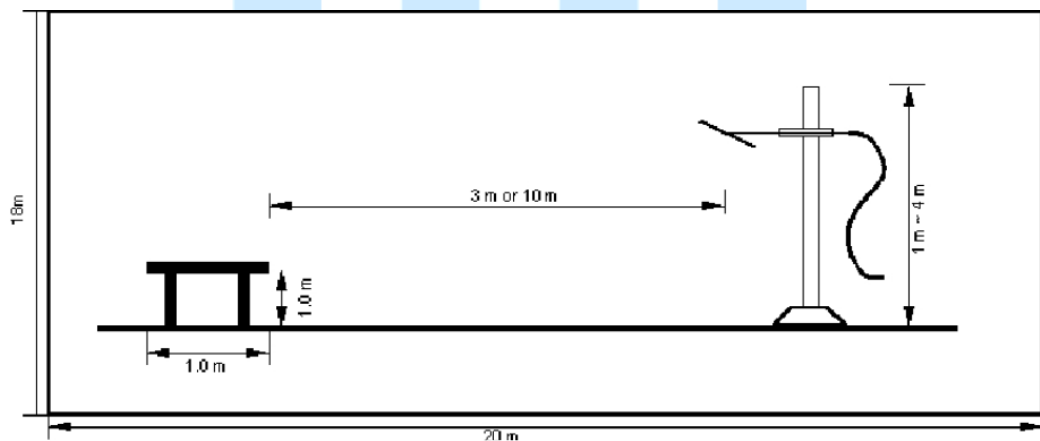


Fig 3. Dimensions of test site (Below 1 GHz)

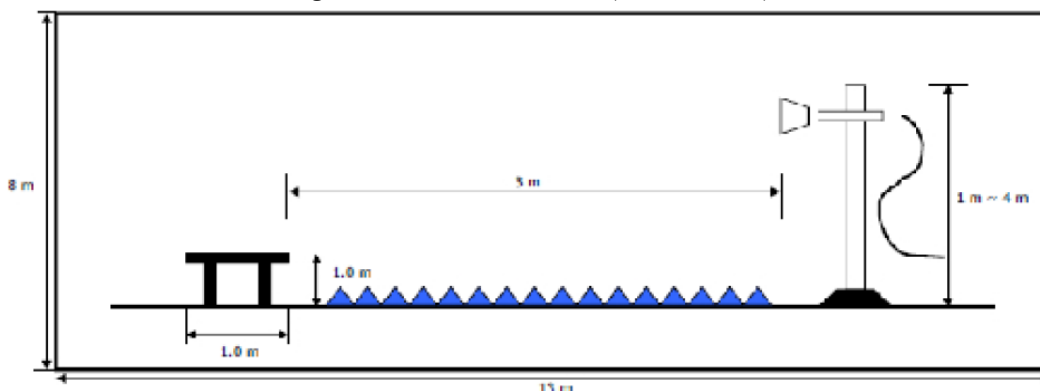


Fig 4. Dimensions of test site (Above 1 GHz)



5. Summary of Test Results

FCC Part Section(s)	Test Description	Test Result
§18.305	Radiated Emission	Pass
§18.307	Conducted Emission	Pass





6. Conducted Emission

6.1 Operating Environment

Temperature : 22.9 °C
Relative Humidity : 43.9 % R.H.
Air Pressure : 99.9 kPa

6.2 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 entering the shield room, were filtered.

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	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



6.4 Limit

RFI Conducted	FCC Limit(dB μ V/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.		

6.5 Test Equipment used

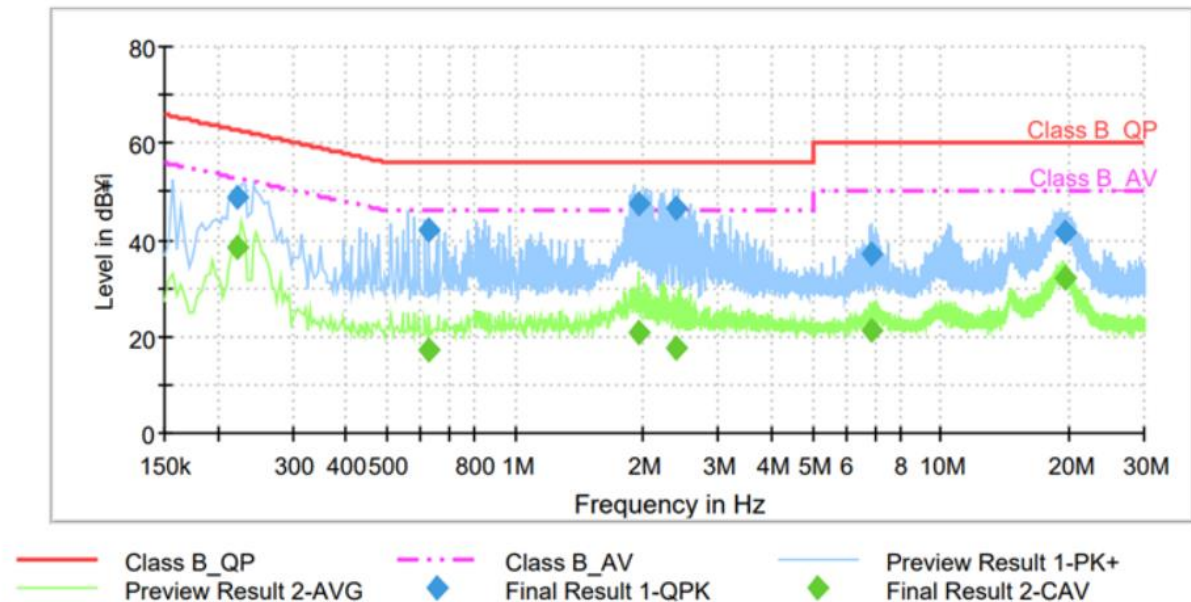
Model Name	Manufacturer	Description	Serial Number	Calibration Date
■ - ESCI	Rohde & Schwarz	EMI Test Receiver	100237	Apr. 05, 2023
□ - ENV216	Rohde & Schwarz	LISN	100172	Apr. 05, 2023
□ - ENV216	Rohde & Schwarz	LISN	100173	Apr. 05, 2023
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	Apr. 06, 2023
■ - VTSD 9561-D	SCHWARZBECK	Pulse Limiter	32	Apr. 06, 2023
■ - EMC 32	Rohde & Schwarz	Software	Ver.8.53	N/A

6.6 Test data for Conducted Emission

- Test Date : May 22, 2023
- 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
0.223356	48.8	1000.0	9.000	GND	L1	19.6	13.9	62.7	
0.624094	42.0	1000.0	9.000	GND	L1	20.0	14.0	56.0	
1.957881	47.5	1000.0	9.000	GND	N	20.6	8.5	56.0	
2.374406	46.4	1000.0	9.000	GND	N	20.6	9.6	56.0	
6.846325	37.2	1000.0	9.000	GND	L1	20.7	22.8	60.0	
19.597081	41.8	1000.0	9.000	GND	N	20.8	18.2	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.223356	38.6	1000.0	9.000	GND	L1	19.6	14.1	52.7	
0.624094	17.3	1000.0	9.000	GND	L1	20.0	28.7	46.0	
1.957881	20.8	1000.0	9.000	GND	N	20.6	25.2	46.0	
2.374406	17.5	1000.0	9.000	GND	N	20.6	28.5	46.0	
6.846325	21.4	1000.0	9.000	GND	L1	20.7	28.6	50.0	
19.597081	32.1	1000.0	9.000	GND	N	20.8	17.9	50.0	

< Fig 5. Graph of continuous disturbance >



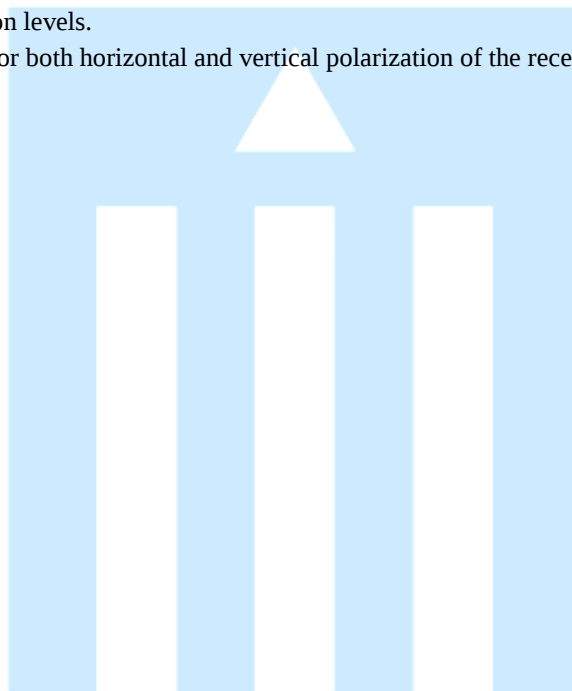
7. Radiated Emission

7.1 Operating Environment

Temperature : 23.8 °C
Relative Humidity : 41.3 % R.H.
Air Pressure : 100.8 kPa

7.2 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.





7.3 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)	5.03 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)	4.77 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Horizontal)	4.79 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Vertical)	4.91 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Horizontal)	4.90 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



7.4 Limit

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

Notes:

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



7.5 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Calibration Date
■ - ESU40	Rohde & Schwarz	EMI Test Receiver	100266	Apr. 05, 2023
■ - HF907	Schwarzbeck	DOUBLE-RIDGED WAVEGUIDE HORN ANTENNA	100538	Jan. 25, 2023
■ - BBHA9170	Schwarzbeck	Horn ANT	766	Apr. 18, 2023
■ - MCU066	matur GmbH	Position Controller	1390306	N/A
■ - CO3000	Innco system GmbH	Position Controller	CO3000/1084/4 2760218/P	N/A
■ - TT2.5SI	matur 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. 10, 2023
■ - TK-PA1840H	Testek	Preamplifier	170007-L	Apr. 10, 2023
■ - WHKX3.0/18G-10SS	WAINWRIGHT INSTRUMENTS	High pass filter	SN31	Apr. 05, 2023
■ - EMC 32	Rohde & Schwarz	Software	Ver 10.40.10	N/A
■ - ESR7	Rohde & Schwarz	EMI Test Receiver	101382	Apr. 05, 2023
■ - VULB9160	Schwarzbeck	Broad Band Test Antenna	3099	Oct. 12, 2021
■ - TK-PA06S	Testek	Low Noise Amplifier	170038-L	Apr. 06, 2023
■ - 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
■ - EMC 32	Rohde & Schwarz	Software	Ver 10.50.10	N/A

7.6 Test data for Radiated Emission

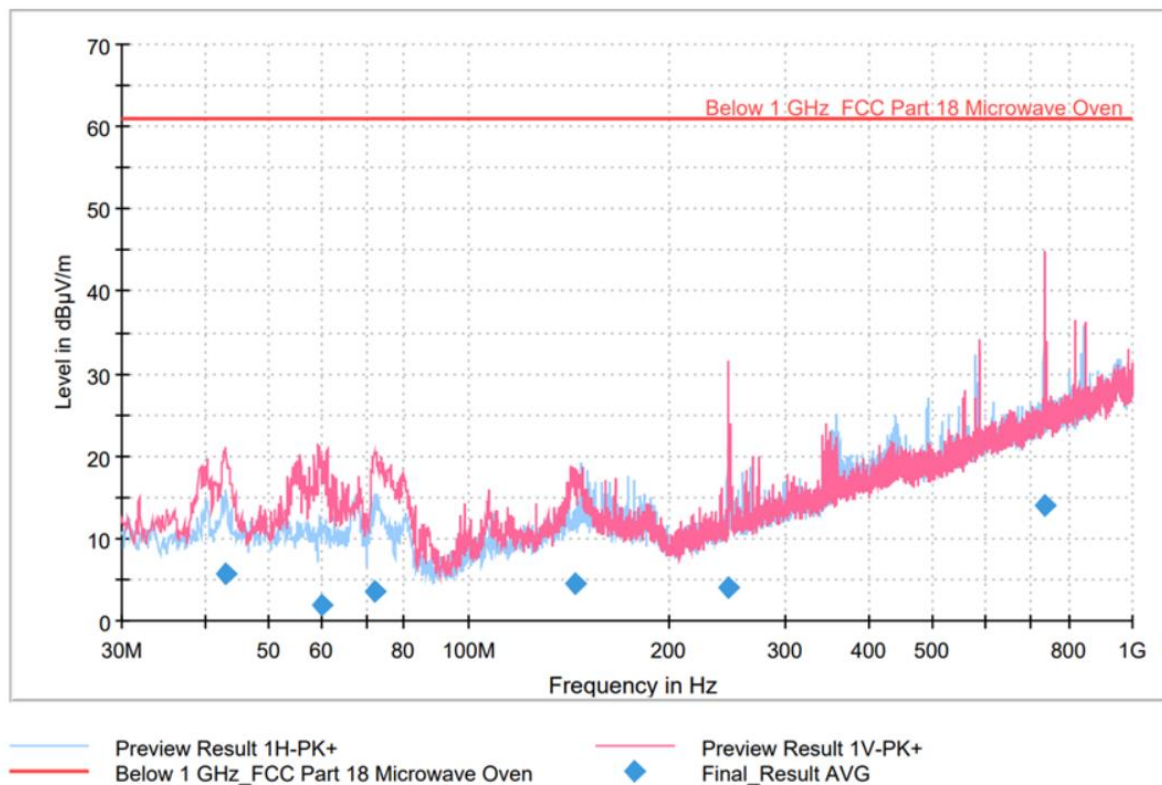
- Test Date : May 24 ~ 25, 2023
- Measurement Distance : 3 m, 10 m
- Note : -

- 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)
42.967800	5.76	60.92	55.16	1000.0	120.000	388.0	V	346.0	-28.6
59.877400	1.99	60.92	58.93	1000.0	120.000	125.0	V	73.0	-28.7
72.242400	3.59	60.92	57.33	1000.0	120.000	375.0	V	240.0	-30.7
144.286200	4.60	60.92	56.32	1000.0	120.000	100.0	V	146.0	-26.3
245.709400	4.14	60.92	56.78	1000.0	120.000	100.0	V	333.0	-26.7
737.119400	13.98	60.92	46.94	1000.0	120.000	375.0	V	321.0	-11.3

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



-. 1 GHz ~ 26 GHz

Freq [GHz]	Pol.	Load [mL]	Load Location	Reading [dB μ V]	Limit [dB μ V/m] @ 3m	Margin [dB]	Height (CM)	Azimuth	Corr (dB/m)
2.214	H	700	Center	60.87	71.38	10.51	120	330	-20.59
2.708	V	700	Center	62.36	71.38	9.02	150	270	-18.39
4.658	V	700	Front	61.92	71.38	9.46	100	60	-9.19
8.264	V	300	Center	64.34	71.38	7.04	130	270	-0.16
19.403	V	700	Center	59.53	71.38	11.85	200	300	27.16
19.443	H	700	Center	58.53	71.38	12.85	110	30	27.22

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.



8. Input Power

8.1 Operating Environment

Temperature : 23.0 °C
Relative Humidity : 35.7 % R.H.
Air Pressure : 99.9 kPa

8.2 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.

8.3 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Calibration Date
■ - 3300AFX-4AGE	PACIFIC	AC&DC POWER SOURCE	149884440	Apr. 25, 2023

8.4 Test data for Input Power

-. Test Date : May 22, 2023
-. 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	15.38	1 728	14.0



9. RF Power Output Measurement according to MP-5

9.1 Operating Environment

Temperature : 23.9 °C
Relative Humidity : 35.7 % R.H.
Air Pressure : 99.9 kPa

9.2 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

9.3 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Calibration Date
■ - 3300AFX-4AGE	PACIFIC	AC&DC POWER SOURCE	149884440	Apr. 25, 2023

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

-. Test Date : May 22, 2023
-. 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	22.3 °C	53.8 °C	120 Sec

$$\text{Power [W]} = \frac{4.187 \times 1\,000 \times 31.5}{120}$$

Power [W] = 1 099.0 Watts



10. Frequency Measurement

10.1 Operating Environment

Temperature : 23.8 °C
Relative Humidity : 37.7 % R.H.
Air Pressure : 100.6 kPa

10.2 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Calibration Date
■ - ESU40	Rohde & Schwarz	EMI Test Receiver	100266	Apr. 05, 2023
■ - HF907	Schwarzbeck	DOUBLE-RIDGED WAVEGUIDE HORN ANTENNA	100538	Jan. 25, 2023
■ - 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. 10, 2023
■ - CO3000	Innco system GmbH	Position Controller	CO3000/1084/4 2760218/P	N/A

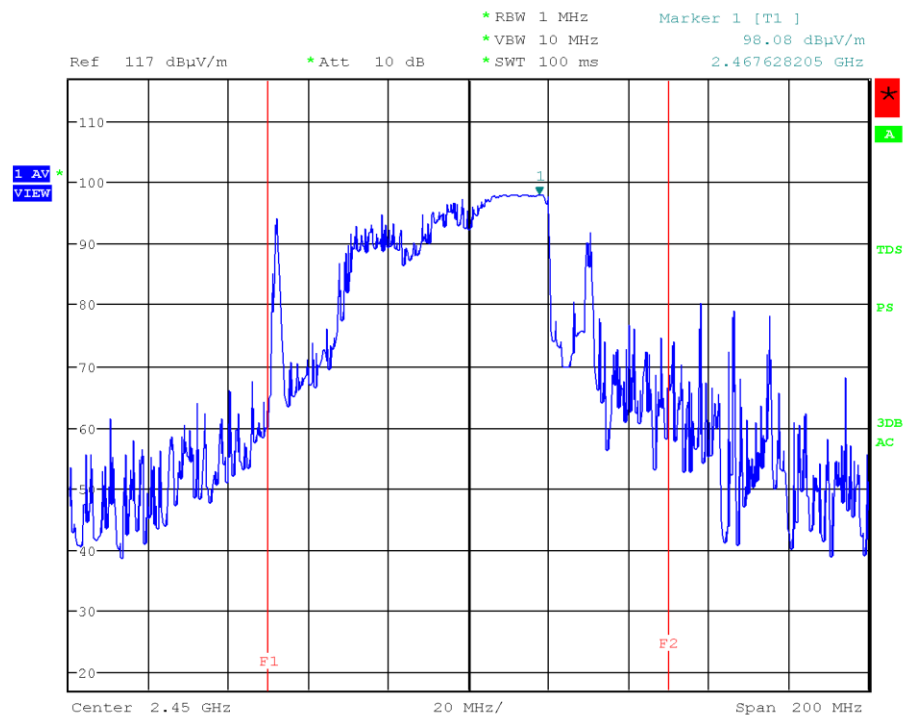
10.3 Test data for Frequency Measurement

10.3.1 Line Voltage Variation Test

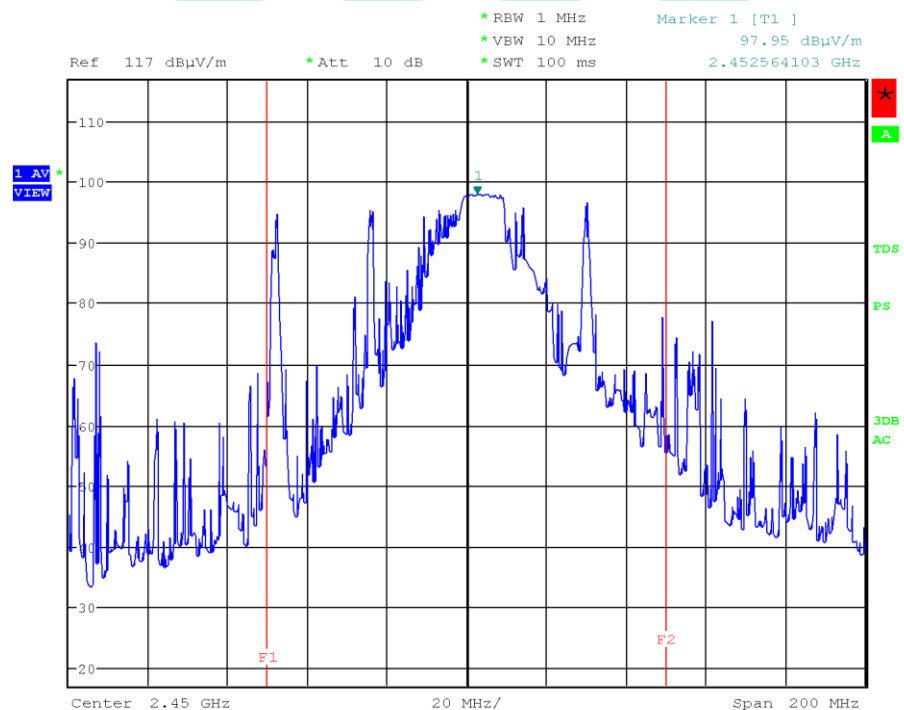
- Test Date : May 24 ~ 25, 2023
- Test condition : Continuous RF output mode
- Test Voltage : AC 96 V, 60 Hz to AC 150 V, 60 Hz
- Load : 1 000 mL
- Fundamental Frequency : 2 450 MHz
- Limit : $2.4 \text{ GHz} < f < 2.5 \text{ GHz}$
- Measurement : Maximum Frequency Observed – 2.467 GHz
Minimum Frequency Observed – 2.452 GHz

Voltage variation (a.c. V)	Pol	Frequency (MHz)	Allowed Tolerance for the ISM Band
96	H	2 462	Lower : 2 400 MHz Upper : 2 500 MHz
	V	2 464	
108	H	2 461	
	V	2 459	
120	H	2 467	
	V	2 458	
132	H	2 456	
	V	2 452	
150	H	2 463	
	V	2 455	

Note* Pol. H= Horizontal, V=Vertical



< Fig 7. Frequency Measurements _ Voltage (Maximum Frequency Observed: 2.467 GHz) >



< Fig 8. Frequency Measurements _ Voltage (Minimum Frequency Observed: 2.452 GHz) >



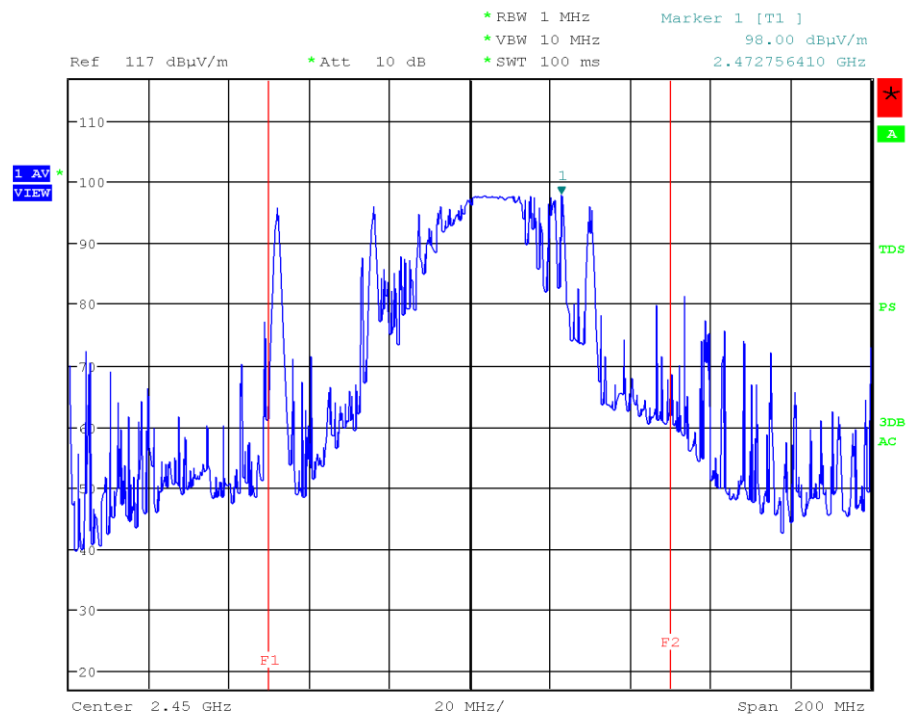
10.3.2 Load Variation Test

- Test Date : May 24 ~ 25, 2023
- 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 : $2.4 \text{ GHz} < f < 2.5 \text{ GHz}$
- Measurement : Maximum Frequency Observed – 2.472 GHz
Minimum Frequency Observed – 2.458 GHz

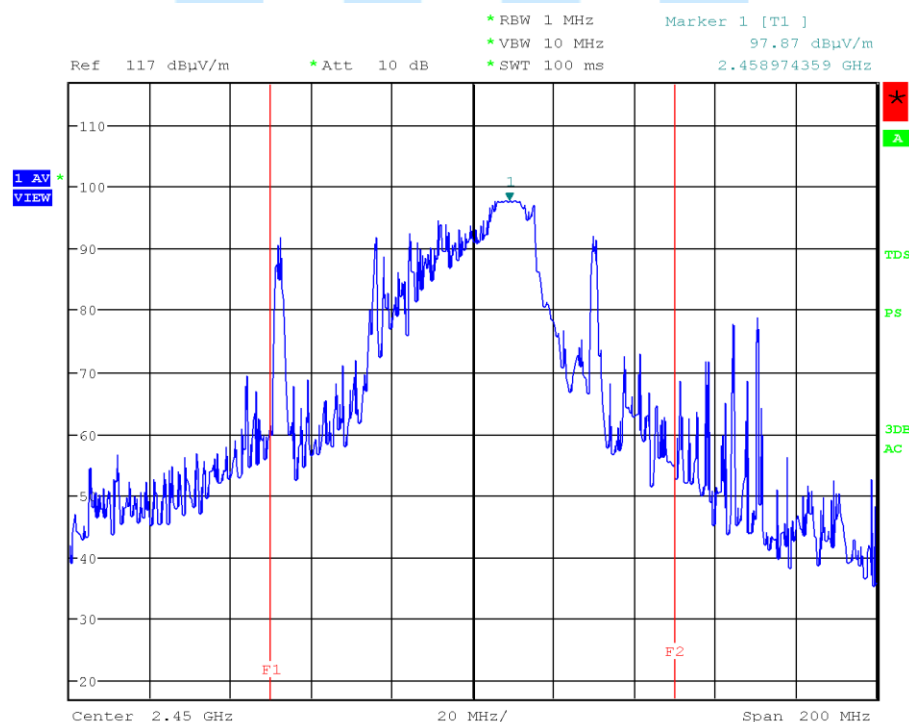
Volume of water (ml)	Pol	Frequency (MHz)	Allowed Tolerance for the ISM Band
200	H	2 458	Lower : 2 400 MHz Upper : 2 500 MHz
	V	2 472	
400	H	2 465	
	V	2 471	
600	H	2 463	
	V	2 467	
800	H	2 465	
	V	2 464	
1 000	H	2 461	
	V	2 465	

Note

* Pol. H= Horizontal, V=Vertical



< Fig 9. Frequency Measurements _Load (Maximum Frequency Observed: 2.472 GHz) >



< Fig 10. Frequency Measurements _Load (Minimum Frequency Observed: 2.458 GHz) >



11. Radiation Hazard Measurement

11.1 Operating Environment

Temperature : 23.2 °C
Relative Humidity : 40.1 % R.H.
Air Pressure : 100.1 kPa

11.2 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Calibration Date
■ - FJZ431HA	Holaday Industries	Microwave Survey Meter - Inc.		Feb. 23, 2023

11.3 Limit

According to §1.1310, the limit for general population/uncontrolled exposures

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(ii) Limits for General Population/Uncontrolled Exposure				
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 – 1,500	/	/	f/1500	<30
1,500 – 100,000	L	L	1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

11.4 Measurement Procedure

The EUT was set-up according to the FCC MP-5 and FCC Part 18 for Radiation Hazard Measurement. The measurement was using a microwave leakage meter to measure the Radiation leakage in the as-received condition with the oven door closed. A 1000ml water load in a beaker was located in the center of the oven and the Microwave Oven was set to maximum power. While the oven operating, the microwave meter will check the leakage and then record the maximum leakage.

11.5 Test data for Radiation Hazard Measurement

-. Test date: May. 22, 2023

Maximum measure level (mW/cm ²)	Limit (mW/cm ²)	Test Result
0.17	1.0	Pass



12. Sample Calculations

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

12.1 Example 1 :

■ 20.3 MHz

Class B Limit	= 250 μV = 48 dB μV
Reading	= 39.2 dB μV
10 ^(39.2dBμV/20)	= 91.2 μV
Margin	= 48 dB μV - 39.2 dB μV
	= 8.8 dB

12.2 Example 2 :

■ 66.7 MHz

Class B Limit	= 100 $\mu\text{V}/\text{m}$ = 40.0 dB $\mu\text{V}/\text{m}$
Reading	= 31.0 dB μV
Antenna Factor + Cable Loss	= 5.8 dB
Total	= 36.8 dB $\mu\text{V}/\text{m}$
Margin	= 40.0 dB $\mu\text{V}/\text{m}$ – 36.8 dB $\mu\text{V}/\text{m}$
	= 3.2 dB



13. Recommendation & Conclusion

The data collected shows that the **LG Electronics USA, Inc. HOUSEHOLD ELECTRIC OVEN(Model Name: WCEP6423D)** was complies with §18.305, 18.307, 18.309 and 18.311 of the FCC Rules.

- The end -

