

EVALUATION REPORT

for Certification of Conformity

FCC Part 18(Class II Permissive change)

Applicant: LG Electronics USA.

111 Sylvan Avenue North Building

Englewood Cliffs New Jersey United States 07632,

Attn: Heejae Cho / Director

Date of Issue: Apr. 17, 2023

Order Number: GETEC-C1-23-235

Test Report Number: GETEC-E3-23-021

Test Site: GUMI UNIVERSITY EMC CENTER

CAB Designation Number: KR0033

FCC ID. : BEJD1724NAD

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
Model Name	: WCES6428F
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 best 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,



Tak Dong Kim, Engineer
GUMI UNIVERSITY EMC CENTER

Reviewed by,



Hyoung Seop Kim, Technical Manager
GUMI UNIVERSITY EMC CENTER



Revision list

Test Report No.	Issue Date	Description
GETEC-E3-23-021	Apr. 17, 2023	First Approval Test Report

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





CONTENTS

1. GENERAL INFORMATION	5
2. INTRODUCTION	6
3. PRODUCT INFORMATION	7
3.1 DESCRIPTION OF EUT.....	7
3.2 SUPPORT EQUIPMENT / CABLES USED	8
3.3 MODIFICATION ITEM(S).....	8
4. DESCRIPTION OF TESTS.....	9
4.1 TEST CONDITION.....	9
4.2 CONDUCTED EMISSION.....	10
4.3 RADIATED EMISSION.....	11
5. SUMMARY OF TEST RESULTS	12
6. CONDUCTED EMISSION.....	13
6.1 OPERATING ENVIRONMENT	13
6.2 TEST SET-UP	13
6.3 MEASUREMENT UNCERTAINTY.....	13
6.4 LIMIT	14
6.5 TEST EQUIPMENT USED.....	14
6.6 TEST DATA FOR CONDUCTED EMISSION	14
7. RADIATED EMISSION	16
7.1 OPERATING ENVIRONMENT	16
7.2 TEST SET-UP	16
7.3 MEASUREMENT UNCERTAINTY.....	17
7.4 LIMIT	18
7.5 TEST EQUIPMENT USED.....	19
7.6 TEST DATA FOR RADIATED EMISSION	19
8. INPUT POWER.....	22
8.1 OPERATING ENVIRONMENT	22
8.2 TEST SET-UP	22
8.3 TEST EQUIPMENT USED.....	22
8.4 TEST DATA FOR INPUT POWER	22
9. RF POWER OUTPUT MEASUREMENT ACCORDING TO MP-5	23
9.1 OPERATING ENVIRONMENT	23
9.2 TEST SET-UP	23
9.3 TEST EQUIPMENT USED.....	23
9.4 TEST DATA FOR RF POWER OUTPUT MEASUREMENT ACCORDING TO MP-5	23
10. FREQUENCY MEASUREMENT	24
10.1 OPERATING ENVIRONMENT	24
10.2 TEST EQUIPMENT USED.....	24
10.3 TEST DATA FOR FREQUENCY MEASUREMENT	24
11. POWER DENSITY SAFETY CHECK.....	28
11.1 TEST SET-UP	28
11.2 TEST EQUIPMENT USED	28
11.3 TEST DATA FOR POWER DENSITY SAFETY CHECK	28



12. SAMPLE CALCULATIONS.....	29
12.1 EXAMPLE 1 :	29
12.2 EXAMPLE 2 :	29
13. RECOMMENDATION & CONCLUSION.....	30

APPENDIX A – ATTESTATION STATEMENT

APPENDIX B – INFORMATION OF CLASS II PERMISSIVE CHANGE

APPENDIX C – SCHEMATIC DIAGRAM

APPENDIX D – TEST SETUP PHOTOGRAPH

APPENDIX E – INTERNAL PHOTOGRAPH





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 North Building
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: Heejae Cho / Director

Telephone Number: 201-472-2623

● FCC ID	BEJD1724NAD
● EUT Type	Household Electric Oven
● Equipment Class	Industrial, Scientific, and Medical equipment
● Model Name	WCES6428F
● 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	Apr 03, 2023 ~ Apr 11, 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-E3-23-021
● Date of Issue	Apr. 17, 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: WCES6428F)**

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)

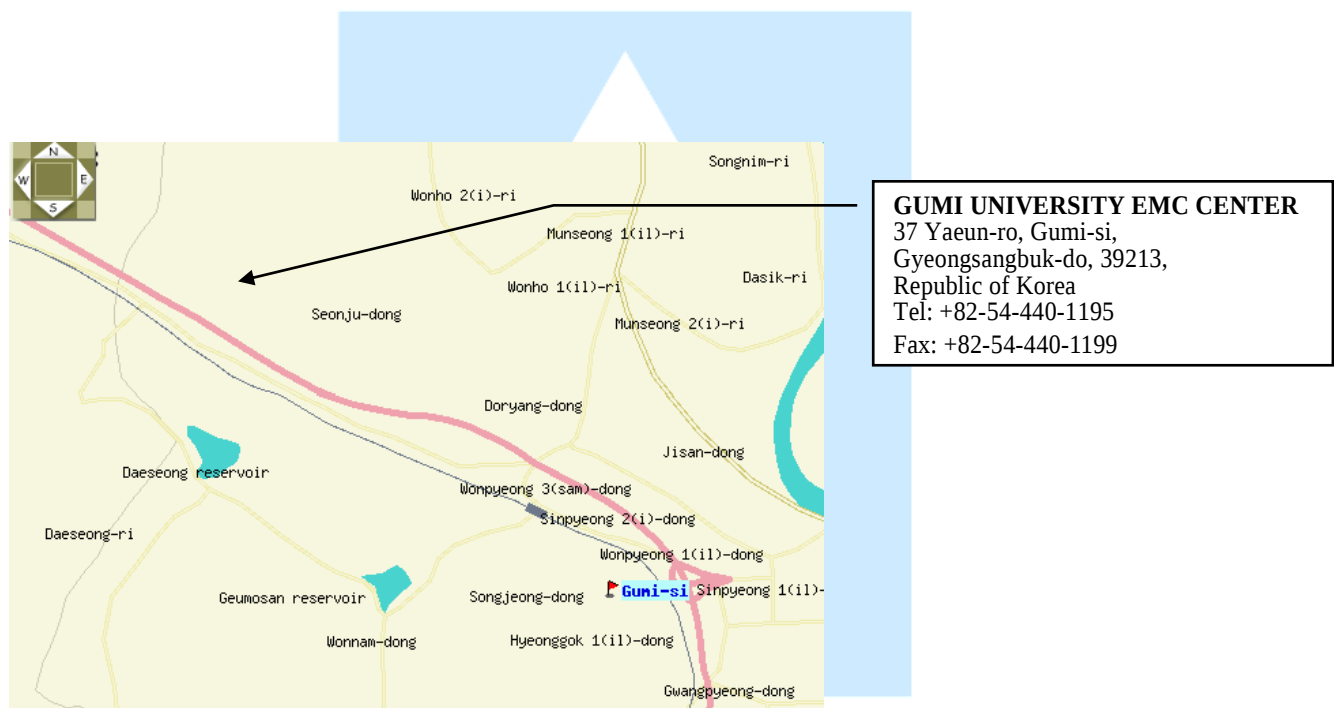


Fig 1. The map above shows the Gumi UNIVERSITY in vicinity area.



3. Product Information

3.1 Description of EUT

The Equipment under Test (EUT) is the **Household Electric Oven (Model Name: WCES6428F)**
FCC ID.: BEJD1724NAD

1	Equipment Class	ISM Consumer Device, Part 18
2	Equipment name	Household Electric Oven
3	Trade name	LG
4	Model number	WCES6428F
5	Manufacturer	LG Electronics Inc. 170, Seongsanpaechong-Ro, Seongsan-Gu, Changwon-Si, Gyeongsangnam-Do, 51533, Korea
6	FCC ID	BEJD1724NAD
7	Serial number & Manufacturer data	Proto type, not provided yet
8	Date of original grant	NA
9	Rated RF power output	975 W
10	Rated power consumption Microwave mode	1650 W
11	Rated current 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) Lower 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



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.	LCW-009	S/N: - FCC ID.: BEJ-LCW009

3.2.3 Used Cable(s)

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

3.3 Modification Item(s)

- None



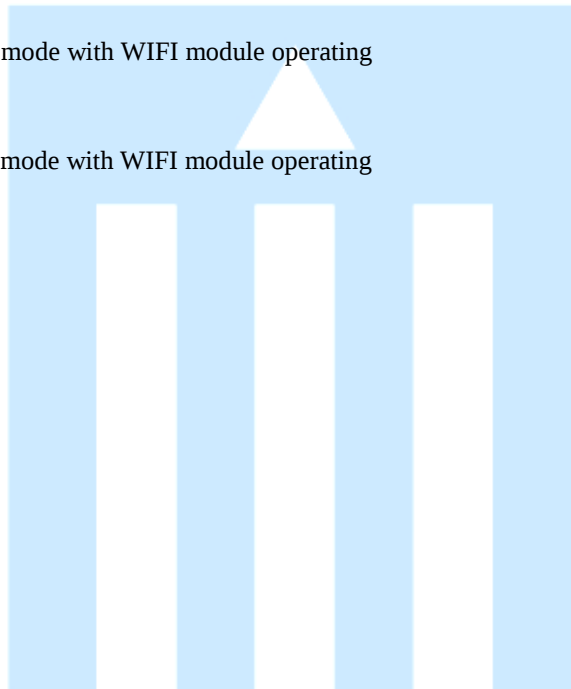
4. Description of tests

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.

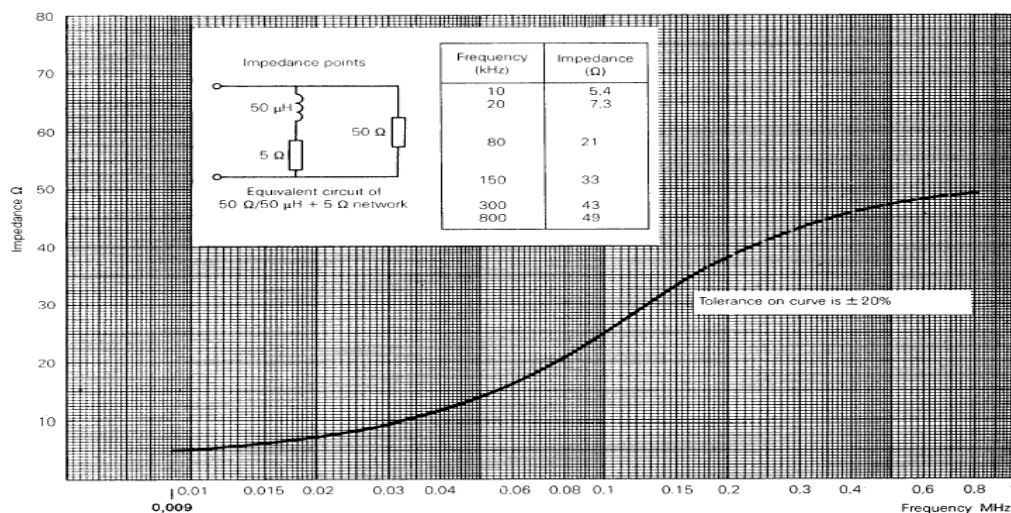


Fig 2. Impedance of LISN



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.

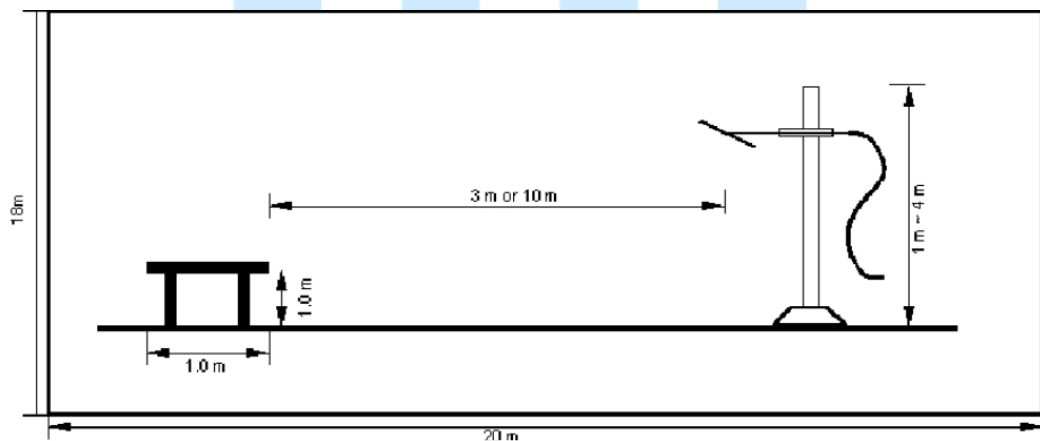


Fig 3. Dimensions of test site (Below 1 GHz)

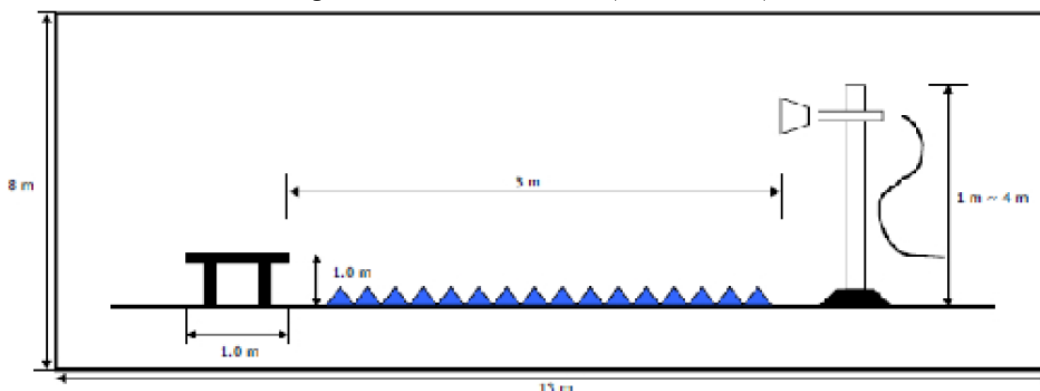


Fig 4. Dimensions of test site (Above 1 GHz)



5. 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 : 23.8 °C
Relative Humidity : 22.8 % R.H.
Air Pressure : 101.7 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

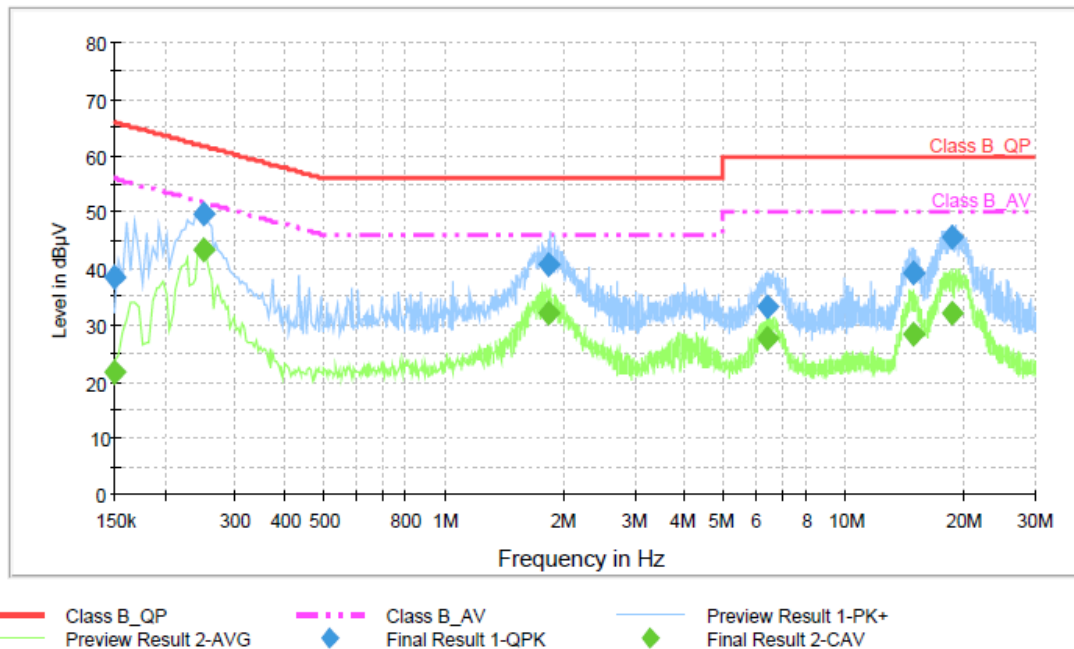
Model Name	Manufacturer	Description	Serial Number	Calibration Date
■ - ESCI	Rohde & Schwarz	EMI Test Receiver	100237	Apr. 05, 2022
□ - ENV216	Rohde & Schwarz	LISN	100172	Apr. 05, 2022
□ - ENV216	Rohde & Schwarz	LISN	100173	Apr. 05, 2022
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	Apr. 06, 2022
■ - VTSD 9561-D	SCHWARZBECK	Pulse Limiter	32	Apr. 06, 2022
■ - EMC 32	Rohde & Schwarz	Software	Ver.8.53	N/A

6.6 Test data for Conducted Emission

- Test Date : Apr 03, 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
0.150000	38.6	1000.0	0.200	GND	L1	20.5	27.4	66.0	
0.250012	49.6	1000.0	9.000	GND	L1	19.7	12.2	61.8	
1.823525	40.9	1000.0	9.000	GND	L1	20.6	15.1	56.0	
6.450038	33.4	1000.0	9.000	GND	N	20.7	26.6	60.0	
14.832694	39.3	1000.0	9.000	GND	L1	21.0	20.7	60.0	
18.551525	45.5	1000.0	9.000	GND	N	20.8	14.5	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	21.8	1000.0	9.000	GND	L1	19.6	34.2	56.0	
0.250012	43.3	1000.0	9.000	GND	L1	19.7	8.5	51.8	
1.823525	32.2	1000.0	9.000	GND	L1	20.6	13.8	46.0	
6.450038	27.7	1000.0	9.000	GND	N	20.7	22.3	50.0	
14.832694	28.3	1000.0	9.000	GND	L1	21.0	21.7	50.0	
18.551525	32.1	1000.0	9.000	GND	N	20.8	17.9	50.0	

< Fig 5. Graph of continuous disturbance >



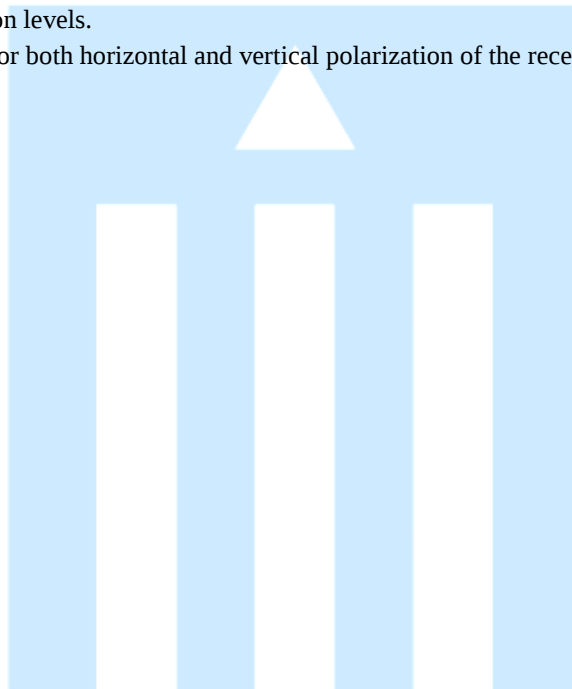
7. Radiated Emission

7.1 Operating Environment

Temperature : 24.3 °C
Relative Humidity : 24.6 % R.H.
Air Pressure : 101.7 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	$2,400/F(\text{kHz})$ $2,400/F(\text{kHz}) \times \text{SQRT}(\text{power}/500)$	300 ³ 300
	490 to 1,600 kHz Above 1,600 kHz	Any Any	$24,000/F(\text{kHz})$ 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. 25, 2022
■ - MCU066	maturio GmbH	Position Controller	1390306	N/A
■ - CO3000	Innco system GmbH	Position Controller	CO3000/1084/4 2760218/P	N/A
■ - TT2.5SI	maturio 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

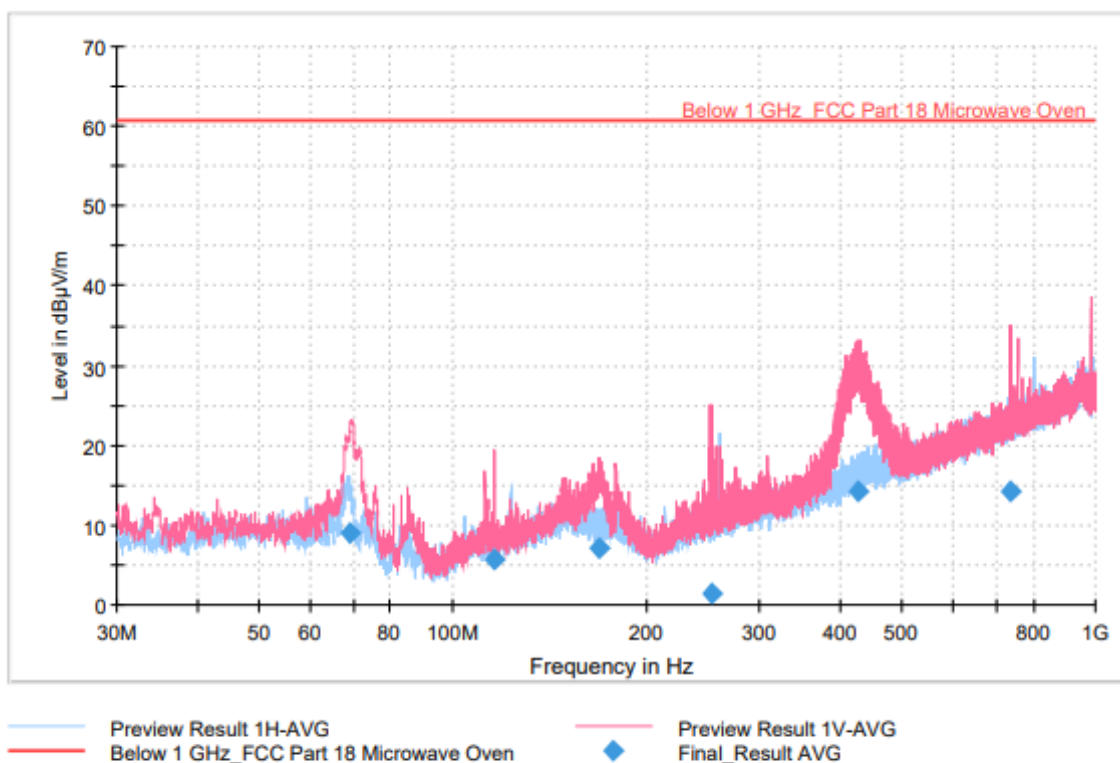
- Test Date : Apr 03, 2023~ Apr 11, 2023
- Measurement Distance : 3 m, 10 m
- Note : -

- 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)
69.241375	8.92	60.85	51.93	1000.0	120.000	135.0	V	256.0	-30.1
115.799400	5.65	60.85	55.20	1000.0	120.000	132.0	V	18.0	-29.2
169.366525	7.22	60.85	53.63	1000.0	120.000	100.0	V	-34.0	-27.2
252.372500	1.50	60.85	59.35	1000.0	120.000	100.0	V	170.0	-26.4
426.862025	14.25	60.85	46.60	1000.0	120.000	231.0	V	134.0	-19.8
737.054950	14.28	60.85	46.57	1000.0	120.000	135.0	V	96.0	-11.3

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



-. 1 GHz ~ 26 GHz

Freq [GHz]	Pol.	Load [mL]	Load Location	Reading [dBμV]	Limit [dBμV/m] @ 3m	Margin [dB]	Height (CM)	Azimuth	Corr (dB/m)
2.618	V	700	Center	60.51	71.31	10.80	120	255	-18.58
2.708	V	700	Center	58.44	71.31	12.87	150	95	-18.39
4.250	V	300	Front	64.29	71.31	7.02	100	10	-9.1
8.456	V	700	Center	61.66	71.31	9.65	100	180	0.27
19.334	H	700	Center	58.82	71.31	12.49	130	330	27.07
19.348	V	700	Center	59.44	71.31	11.87	110	30	27.09

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 : 22.5 °C
Relative Humidity : 35.1 % R.H.
Air Pressure : 101.5 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	May. 17, 2022

8.4 Test data for Input Power

- Test Date : Apr 04, 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	15.63	1 738	14.0



9. RF Power Output Measurement according to MP-5

9.1 Operating Environment

Temperature : 23.0 °C
Relative Humidity : 34.1 % R.H.
Air Pressure : 101.5 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	May. 17, 2022

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

-. Test Date : Apr 04, 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	20.7 °C	51.7 °C	120 Sec

$$\text{Power [W]} = \frac{4.187 \times 1\,000 \times 31.0}{120}$$

Power [W] = 1 081.6 Watts



10. Frequency Measurement

10.1 Operating Environment

Temperature : 21.5 °C
Relative Humidity : 33.9 % R.H.
Air Pressure : 101.7 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	matur GmbH	Position Controller	1390306	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
■ - CO3000	Innco system GmbH	Position Controller	CO3000/1084/4 2760218/P	N/A

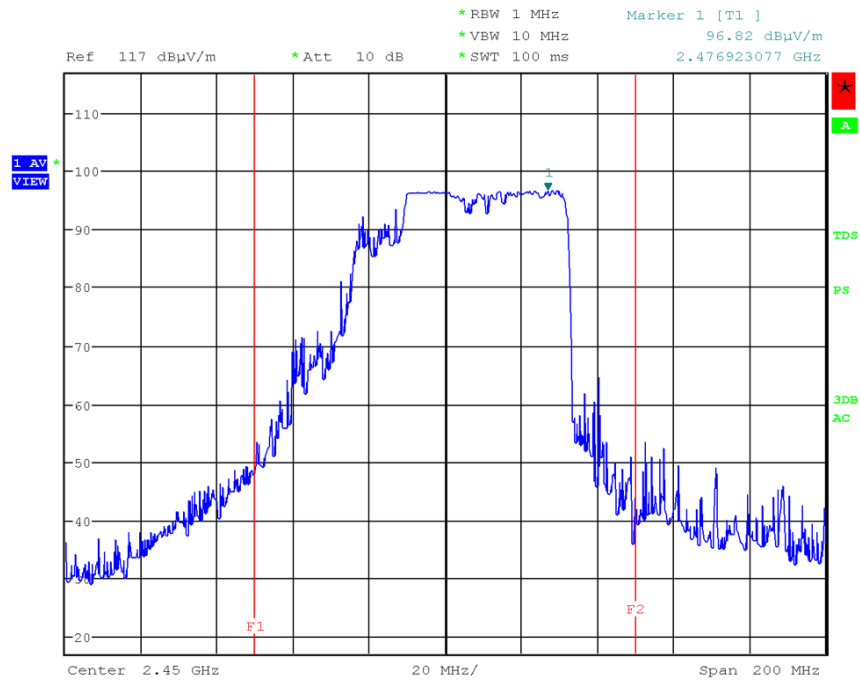
10.3 Test data for Frequency Measurement

10.3.1 Line Voltage Variation Test

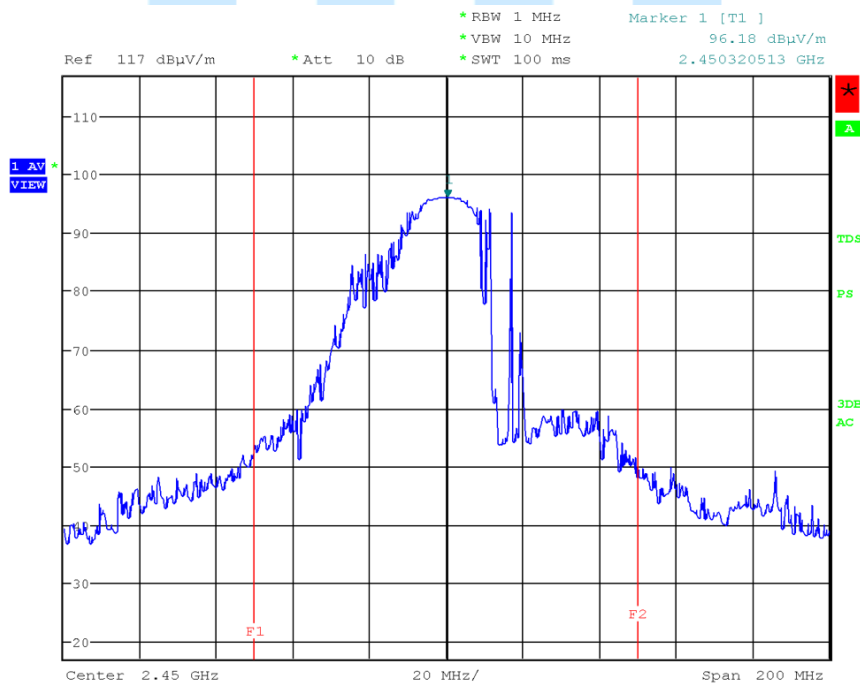
- Test Date : Apr 10, 2023
- Test condition : Continuous RF output mode
- Test Voltage : AC 96 V, 60 Hz to AC 150 V, 60 Hz
- Load : 1 000 mL
- Fundamental Frequency : 2 450 MHz
- Limit : 2.4 GHz < f < 2.5 GHz
- Measurement : Maximum Frequency Observed – 2. 476 GHz
Minimum Frequency Observed – 2.450 GHz

Voltage variation (a.c. V)	Pol	Frequency (MHz)	Allowed Tolerance for the ISM Band
96	H	2 469	Lower : 2 400 MHz Upper : 2 500 MHz
	V	2 465	
108	H	2 454	
	V	2 450	
120	H	2 465	
	V	2 474	
132	H	2 452	
	V	2 468	
150	H	2 476	
	V	2 470	

Note* Pol. H= Horizontal, V=Vertical



< Fig 7. Frequency Measurements _ Voltage (Maximum Frequency Observed: 2.476 GHz) >



< Fig 8. Frequency Measurements _ Voltage (Minimum Frequency Observed: 2.450 GHz) >



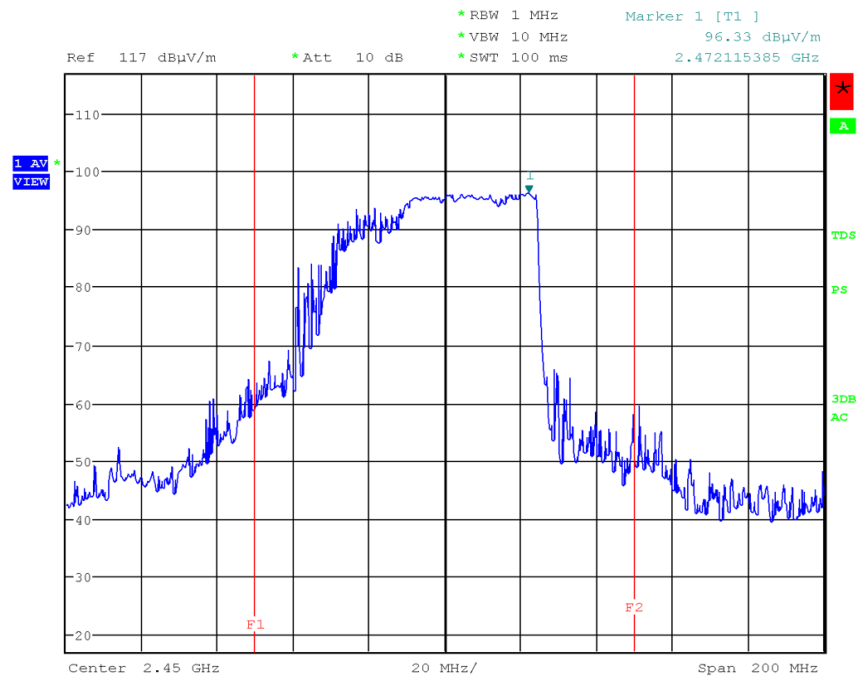
10.3.2 Load Variation Test

- Test Date : Apr 10, 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 – 2.449 GHz

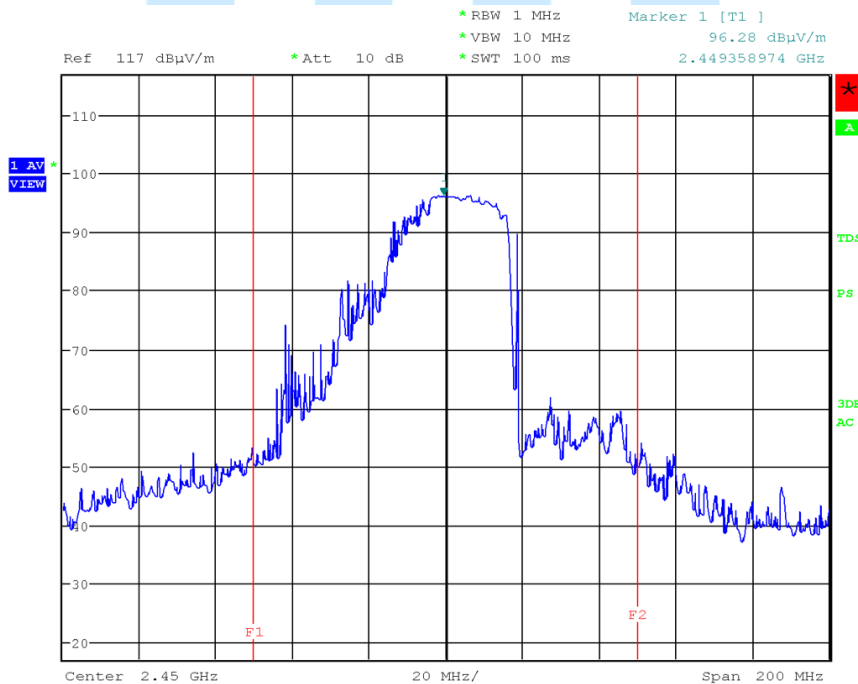
Volume of water (ml)	Pol	Frequency (MHz)	Allowed Tolerance for the ISM Band
200	H	2 472	Lower : 2 400 MHz Upper : 2 500 MHz
	V	2 470	
400	H	2 471	
	V	2 468	
600	H	2 472	
	V	2 449	
800	H	2 465	
	V	2 463	
1 000	H	2 469	
	V	2 471	

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: 2.449 GHz) >



11. Power Density Safety Check

11.1 Test Set-up

The power density was checked to ensure that the power is not greater than 1.0 mW/cm² at any location of the oven. The 1.0 mW/cm² 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 did not exceed the specified limits.

11.2 Test Equipment used

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

11.3 Test data for Power Density Safety Check

-. Test date: Apr. 03, 2023

-. Measurement

Maximum Leakage Microwave Observed: 0.17 mW/cm²



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. Household Electric Oven(Model Name: WCES6428F)** was complies with §18.305, 18.307, 18.309 and 18.311 of the FCC Rules.

- The end -

