FCC EVALUATION REPORT FOR CERTIFICATION

Applicant: LG Electronics Inc.

170, Sungsanpaechong-ro, Seongsan-gu,

Changwon-si, Gyeongsangnam-do, 642-711, Korea.

Attn: Sung-gun Cho/ Research Engineer

Date of Issue: Jan. 20, 2017

Order Number: GETEC-C1-16-520

Test Report Number: GETEC-E3-16-072

Test Site: GUMI UNIVERSITY EMC CENTER

FCC Registration Number: (269701)

FCC ID. : BEJS209FZ

Applicant : LG Electronics Inc.

Rule Part(s)	**: FCC Part 18**
Equipment Class	**: Industrial, Scientific, and Medical equipment**
EUT Type	**: Microwave Oven**
Type of Authority	**: Certification**
Model Name	**: MS2096HST**
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 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 / Associate Engineer
GUMI UNIVERSITY EMC CENTER

Reviewed by,

Jae-Hoon Jeong / Technical Manager
GUMI UNIVERSITY EMC CENTER

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 INC.
Applicant Address: 170, Sungsanpaechong-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-di, 642-711, Korea
Manufacturer: LG ELECTRONICS INC. KITCHEN PACKAGE DIVISION
Manufacturer Address: 170, Sungsanpaechong-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-di, 642-711, Korea
Contact Person: Sung-gun Cho/ Research Engineer
Telephone Number: +82-55-260-3966

- **FCC ID** BEJS209FZ
- **EUT Type** Microwave Oven
- **Equipment Class** Industrial, Scientific, and Medical equipment
- **Model Name** MS2096HST
- **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** Dec. 31 , 2016 ~ Jan. 12, 2017
- **Place of Test** **GUMI UNIVERSITY EMC CENTER**
  (FCC Test Firm Registration Number: 269701)
  37 Yaeun-ro, Gumi-si, Gyeongsangbuk-do, 730-711, Republic of Korea.
- **Test Report Number** GETEC-E3-16-072
- **Date of Issue** Jan. 20, 2017

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 INC. Microwave Oven (Model Name: MS2096HST)**

These measurement tests were conducted at **GUMI UNIVERSITY EMC CENTER**
The site address is 37 Yaeun-ro, Gumi-si, Gyeongsangbuk-do, 730-711, 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)

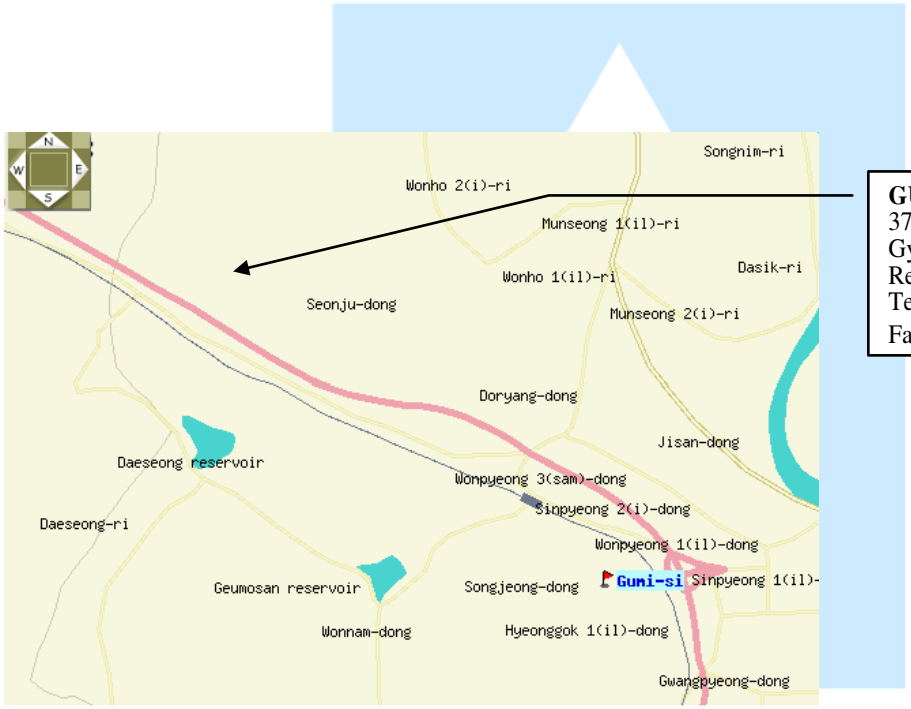


Fig 1. The map above shows the Gumi UNIVERSITY in vicinity area.

3. Product Information

3.1 Description of EUT

The Equipment under Test (EUT) is the **LG Electronics Inc.**
Microwave Oven (Model Name: MS2096HST) FCC ID.: BEJS209FZ

1	Equipment Class	ISM Consumer Device, Part 18
2	Equipment name	Microwave oven
3	Trade mane	LG
4	Model number	LG-MS2096HST, Buyer-LMC2075BD LG- MS2096HSS, Buyer- LMC2075ST LG- MS2096JSS, Buyer- LMC2075SB LG- MS2096JSH, Buyer- LMC2075SW
5	Manufacturer	LG Electronics Tianjin Appliances Co., Ltd. Xing Dian Road, Bei Chen District, Tianjin, China PostCode : 300402
6	FCC ID	BEJS209FZ
7	Serial number & Manufacturer data	Proto type, not provided yet
8	Date of original grant	NA
9	Rated RF power output	1200 W
10	Rated power consumption Microwave mode	1200 W
11	Rated current Microwave mode	10.0A
12	Overall dimensions (inch)	23-7/8 X 13-9/16 X 19-13/16 (W x H x D)
13	Cavity dimensions (inch)	16-11/16 X11-1/4 X 18-1/16 (W x H x D)
14	Cavity volume	2.0 cu.ft
15	Magnetron	2M286
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.
Microwave Oven	LG ELECTRONICS INC.	MS2096HST	S/N: None FCC ID.: BEJS209FZ

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.
-	-	-	-

3.2.3 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the EUT and AC power source	0.90 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

  - **Radiated Emission**
    -. Continuous RF output mode

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.

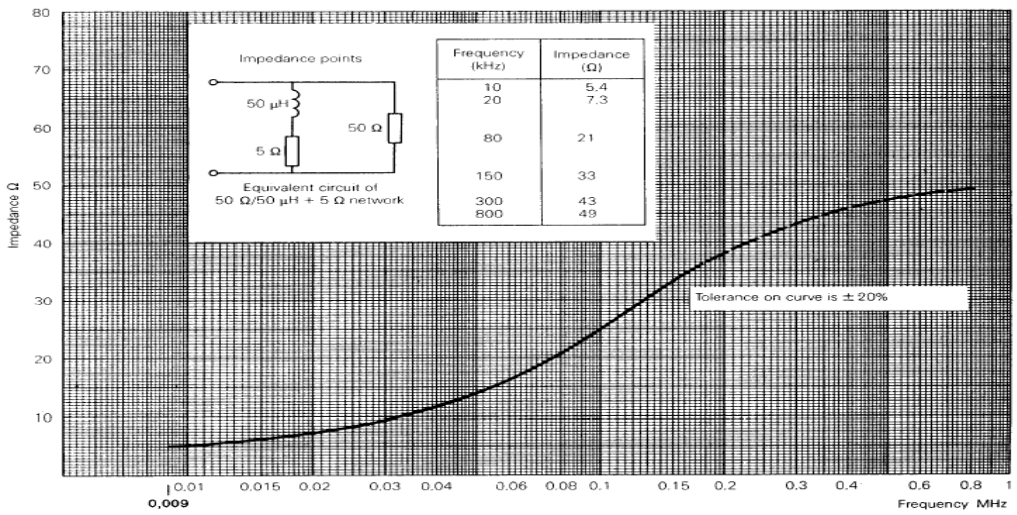


Fig 2. Impedance of LISN

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.

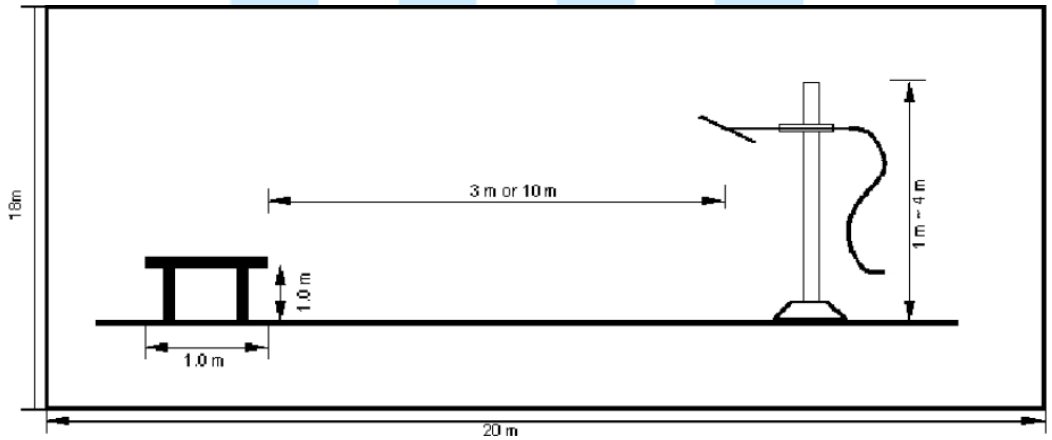


Fig 3. Dimensions of test site (Below 1 GHz)

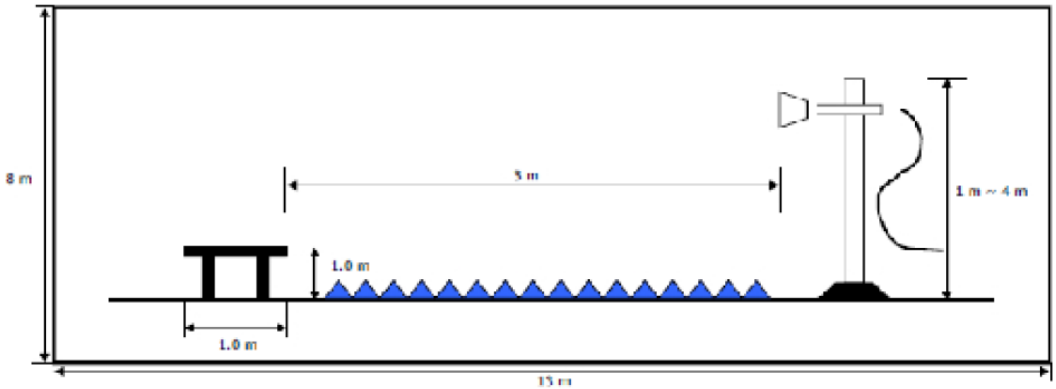


Fig 4. Dimensions of test site (Above 1 GHz)

5. Conducted Emission

5.1 Operating Environment

Temperature : 22.0 ℃
Relative Humidity : 41.9 % R.H.

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 plan e (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)	3.85 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.		

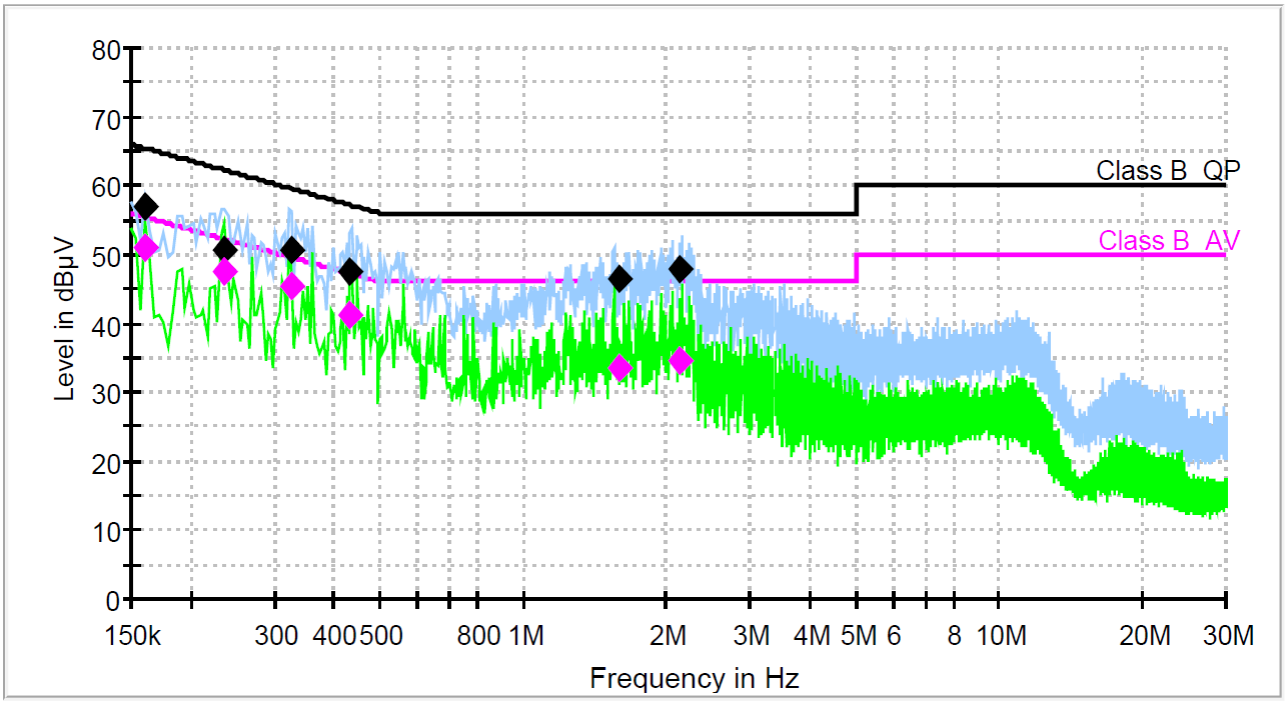
5.5 Test Equipment used

	Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ -	ESCI	Rohde & Schwarz	EMI Test Receiver	100237	Apr. 18, 2017
■ -	ENV216 (EUT)	Rohde & Schwarz	LISN	100173	Apr. 19, 2017
☐ -	ENV216 (A.E)	Rohde & Schwarz	LISN	100172	Apr. 19, 2017
☐ -	ESH2-Z5	Rohde & Schwarz	LISN	829991/009	Apr. 19, 2017
☐ -	ESH3-Z2	Rohde & Schwarz	Pulse limiter	357.8810.52	Apr. 19, 2017
☐ -	ISN T8	TESEQ.GmbH	ISN	24568	Apr. 22, 2017
■ -	EMC 32	Rohde & Schwarz	Software	Ver 8.53	N/A

5.6 Test data for Conducted Emission

-. Test Date : Jan. 04, 2017
-. Resolution Bandwidth : 9 kHz
-. Frequency Range : 0.15 MHz ~ 30 MHz
-. Line : L1: Live, N: Neutral

▪ Operating condition: Continuous RF output mode
Black(◆) marker: Quasi Peak detector ; Pink(◆) marker: Average detector
Black line: Peak value ; Pink line: Average value



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.161188	57.0	1000.0	9.000	Off	N	9.6	8.4	65.4	
0.235819	50.8	1000.0	9.000	Off	N	9.6	11.4	62.2	
0.325369	50.8	1000.0	9.000	Off	N	9.7	8.8	59.6	
0.433575	47.4	1000.0	9.000	Off	N	9.7	9.8	57.2	
1.584219	46.5	1000.0	9.000	Off	L1	9.7	9.5	56.0	
2.140681	48.0	1000.0	9.000	Off	L1	9.7	8.0	56.0	

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.161188	51.0	1000.0	9.000	Off	N	9.6	4.4	55.4	
0.235819	47.4	1000.0	9.000	Off	N	9.6	4.8	52.2	
0.325369	45.3	1000.0	9.000	Off	N	9.7	4.3	49.6	
0.433575	41.2	1000.0	9.000	Off	N	9.7	6.0	47.2	
1.584219	33.7	1000.0	9.000	Off	L1	9.7	12.3	46.0	
2.140681	34.6	1000.0	9.000	Off	L1	9.7	11.4	46.0	

< Fig 5. Graph of continuous disturbance >

6. Radiated Emission

6.1 Operating Environment

Temperature : 22.1 ℃
Relative Humidity : 41.9 % R.H.

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)	5.06 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	5.03 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (1 000 MHz ~ 6 000 MHz, 3 m)	5.42 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (1 000 MHz ~ 18 000 MHz, 3 m)	5.64 dB	Confidence level of approximately 95 % (k = 2)
Test Items(10 m Anechoic Chamber)	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	4.36 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	4.37 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	4.49 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	4.47 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 500 500 or more	25 25×SQRT(power/500)	300 [1]300
	Any non-ISM frequency	**Below 500** 500 or more	**15** 15×SQRT(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 non-ISM frequency	Any Any	25 15	300 300
Ultrasonic	Below 490 kHz	Below 500 500 or more	2,400/F(kHz) 2,400/F(kHz)× SQRT (power/500)	300 [3]300
	490 to 1,600 kHz Above 1,600 kHz	Any Any	24,000/F(kHz) 15	30 30
Induction cooking ranges	Below 90 kHz On or above 90 kHz	Any Any	1,500 300	[4]30 [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] = $10^{[(\text{Field strength at 10m(dBuV/m)}-29.5)/20]}$
* Field Strength above 1,000 MHz (at 300 m) [μV/m] = K * $10^{[\text{Field strength at 3m(dBuV/m)}/20]}$

6.5 Test Equipment used

	Model Name	Manufacturer	Description	Serial Number	Due to Calibration
☐ -	ESIB26	Rohde & Schwarz	EMI Test Receiver	830482/010	Apr. 18, 2017
■ -	ESU40	Rohde & Schwarz	EMI Test Receiver	100266	Jul. 20, 2017
■ -	BBHA9120D	Schwarzbeck	Horn ANT	207	Oct. 14, 2017
■ -	3160-09	ETS LINDGREN	Horn ANT	218457	Feb. 11, 2017
■ -	MCU066	maturo GmbH	Position Controller	1390306	N/A
■ -	TT2.5SI	maturo GmbH	Turntable	1390307	N/A
■ -	AM 4.0	maturo GmbH	Antenna Mast	1390308	N/A
■ -	AFS 44 00101800-25-10P-44	MITEQ	Preamplifier	1258943	Dec. 06, 2017
■ -	SCU-F1826-G47-BZ42-CSS(F)	Rohde & Schwarz	Preamplifier	10003	Dec. 09, 2017
■ -	WHKX3.0/18G-10SS	WAINWRIGHT INSTRUMENTS	High pass filter	SN31	Apr. 19, 2017
■ -	ESR7	Rohde & Schwarz	EMI Test Receiver	101382	Apr. 18, 2017
■ -	VULB9160	Schwarzbeck	Broad Band Test Antenna	3193	Mar. 28, 2018
■ -	87405A	Agilent	Preamplifirer	MY39500777	Dec. 06, 2017
■ -	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

6.6 Test data for Radiated Emission

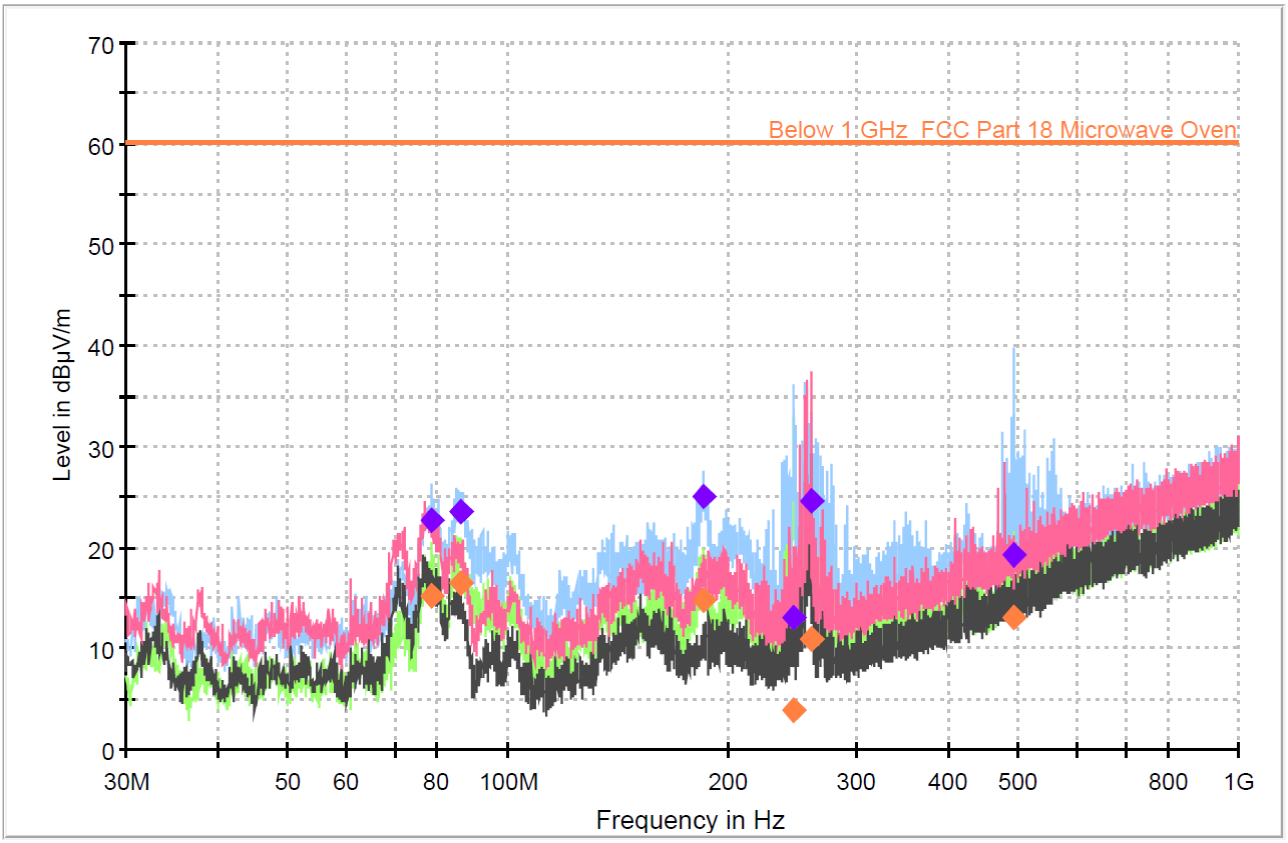
-. Test Date : Dec. 31, 2016 ~ Jan. 12. 2017
-. Measurement Distance : 3 m,10 m
-. Note : -

-. Measurement

Frequency range	30 MHz ~ 1 GHz @ 10 m	Above 1 GHz @ 3m
Detector mode	Quasi peak	Peak / Average
Resolution bandwidth	120 kHz	1 MHz

-. 30 MHz ~ 1 GHz

▪ Operating condition: Continuous RF output mode
Violet(◆) marker: Quasi Peak detector ; Orange(◆) marker: Average detector
Orange line: Average value



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
78.698	---	15.25	60.05	44.80	1000.0	120.000	400.1	H	259.0	-14.8
78.698	22.72	---	60.05	37.33	1000.0	120.000	400.1	H	259.0	-14.8
85.997	---	16.44	60.05	43.61	1000.0	120.000	400.0	H	255.0	-15.4
85.997	23.50	---	60.05	36.55	1000.0	120.000	400.0	H	255.0	-15.4
185.056	---	14.85	60.05	45.20	1000.0	120.000	400.0	H	103.0	-11.3
185.056	25.06	---	60.05	34.99	1000.0	120.000	400.0	H	103.0	-11.3
245.795	---	3.80	60.05	56.25	1000.0	120.000	249.9	H	320.0	-10.3
245.795	13.04	---	60.05	47.01	1000.0	120.000	249.9	H	320.0	-10.3
260.110	24.67	---	60.05	35.38	1000.0	120.000	111.1	V	138.0	-9.8
260.110	---	10.85	60.05	49.20	1000.0	120.000	111.1	V	138.0	-9.8
492.769	19.31	---	60.05	40.74	1000.0	120.000	220.9	H	258.0	-3.2
492.769	---	12.96	60.05	47.09	1000.0	120.000	220.9	H	258.0	-3.2

< 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]
2.381	H	300	Center	62.00	70.51	8.51
2.385	H	700	Center	61.75	70.51	8.76
2.391	H	300	Rt. Front	65.44	70.51	5.07
18.204	H	300	Rt. Front	61.39	70.51	9.12
19.335	V	300	Center	65.96	70.51	4.55
19.498	H	700	Rt. Front	50.70	70.51	19.81

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 : 15.1 ℃
Relative Humidity : 24.8 % R.H.

7.2 Test Set-up

Test input power was measured using Wattmeter. A 275 mL water load in a polypropylene beaker is placed in the center of the oven. The 275 mL water was chosen for its compatibility with UL procedure to determine input ratings. The oven was operated at the rated input and full output power for 6 minutes.

7.3 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - 360AMX	Pacific	AC power source	0438	N/A
■ - PM6000	Voltech	Power analyzer	100006700132	Mar. 04, 2017

7.4 Test data for Input Power

-. Test Date : Dec. 31, 2016
-. Test condition : Continuous RF output mode (Load: 275 mL)

-. Measurement

Mode	Input Voltage	Current [A]	Power Consumption [W]	Manufacturer Rating [A]
Microwave	AC 120 V, 60 Hz	12.19	1 349.1	10.0

8. RF Power Output Measurement according to MP-5

8.1 Operating Environment

Temperature : 15.4 ℃
Relative Humidity : 27.6 % R.H.

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	Due to Calibration
■	360AMX	Pacific	AC power source	0438	N/A
■	PM6000	Voltech	Power analyzer	100006700132	Mar. 04, 2017

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

-. Test Date : Dec. 31, 2016
-. 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	9.6 ℃	35.4 ℃	120 Sec

$$\text{Power [W]} = \frac{4.187 \times 1\,000 \times 25.8}{120}$$

Power [W] = 900.21 Watts

9. Frequency Measurement

9.1 Operating Environment

Temperature : 23.2 ℃
Relative Humidity : 33.4 % R.H.

9.2 Test Equipment used

	Model Name	Manufacturer	Description	Serial Number	Due to Calibration
☐	- ESIB26	Rohde & Schwarz	EMI Test Receiver	830482/010	Apr. 18, 2017
■	- ESU40	Rohde & Schwarz	EMI Test Receiver	100266	Jul. 20, 2017
■	- BBHA9120D	Schwarzbeck	Horn ANT	207	Oct. 14, 2017
☐	- 3160-09	ETS LINDGREN	Horn ANT	218457	Feb. 11, 2017
■	- MCU066	maturo GmbH	Position Controller	1390306	N/A
■	- TT2.5SI	maturo GmbH	Turntable	1390307	N/A
■	- AM 4.0	maturo GmbH	Antenna Mast	1390308	N/A
■	- AFS 44 00101800-25-10P-44	MITEQ	Preamplifier	1258943	Dec. 06, 2017
☐	- SCU-F1826-G47-BZ42-CSS(F)	Rohde & Schwarz	Preamplifier	10003	Dec. 09, 2017

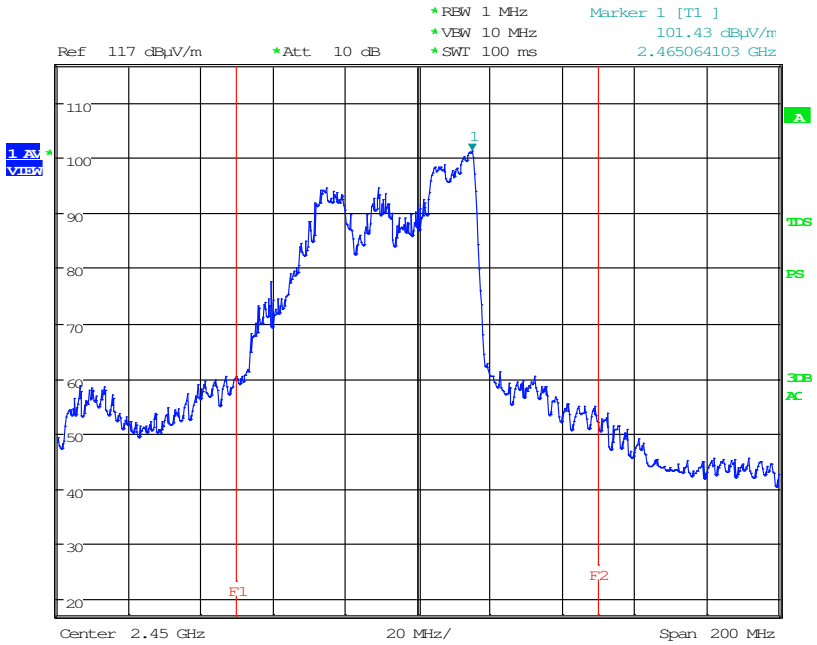
9.3 Test data for Frequency Measurement

9.3.1 Line Voltage Variation Test

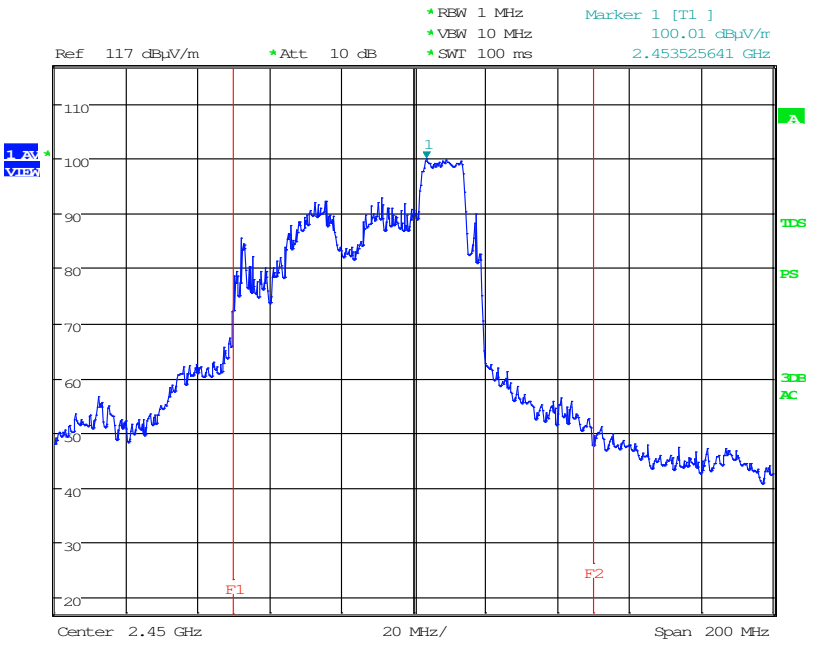
-. Test Date : Dec. 31, 2016
-. Test condition : Continuous RF output mode
-. Test Voltage : AC 96 V, 60 Hz and AC 150 V, 60 Hz
-. Load : 1 000 mL
-. Fundamental Frequency : 2 450 MHz
-. Limit : 2.4 GHz < f < 2.5 GHz
-. Measurement : Maximum Frequency Observed – 2. 465 GHz
Minimum Frequency Observed – 2.453 GHz

9.3.2 Load Variation Test

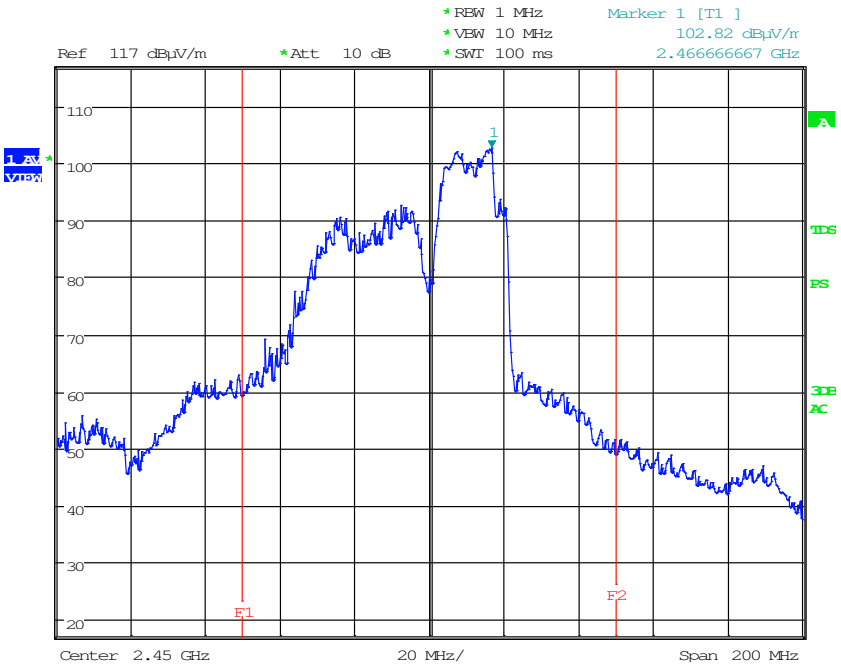
-. Test Date : Dec. 31, 2016
-. Test condition : Continuous RF output mode
-. Test Voltage : AC 120 V, 60 Hz
-. Initial Load : 1 000 mL
-. Final Load : 200 mL
-. Fundamental Frequency : 2 450 MHz
-. Limit : 2.4 GHz < f < 2.5 GHz
-. Measurement : Maximum Frequency Observed – 2.466 GHz
Minimum Frequency Observed – 2.448 GHz



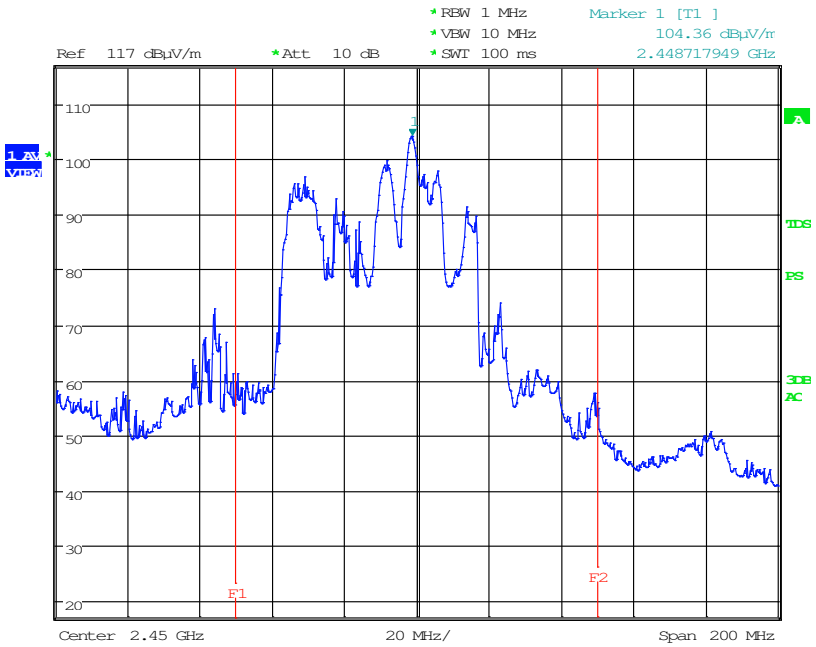
< Fig 7. Frequency Measurements (Maximum Frequency Observed: 2.465 GHz) >



< Fig 8. Frequency Measurements (Minimum Frequency Observed: 2.453 GHz) >



< Fig 9. Frequency Measurements (Maximum Frequency Observed: 2.466 GHz) >



< Fig 10. Frequency Measurements (Minimum Frequency Observed: 2.448 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	Due to Calibration
■ -	Holaday	ETS LINDGREN	Microwave Survey Meter	FJZ431 HA	Jul. 30 2017

10.3 Test data for Power Density Safety Check

-. Measurement

Maximum Leakage Microwave Observed: 0.27 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 INC. Microwave Oven (Model Name: MS2096HST)** was complies with §18.305, 18.307, 18.309 and 18.311 of the FCC Rules.

- The end -