LG Electronics Inc.

Digital Appliance Company, EMC Center

391-2, Ga Eum Jeong – Dong, Changwon City, Gyeong Nam
641-711, KOREA
Tel: + 82 55 260 3966, Fax: +82 55 260 3968

CERTIFICATION OF COMPLIANCE

Date of Issue: April 20, 2005 **Test Report No: 05-LAE-M096**

Test Site: LG Electronics Changwon EMC Center

Applicant:	LG Electronics Inc.
Regulation:	FCC Part 18 – ISM Consumer Device
Test Procedure:	MP-5: 1985
Equipment Class:	Industrial, Scientific, and Medical equipment
EUT Type:	Microwave oven
Magnetron Type:	2M248J (Toshiba Hokuto Electronics Corp.)
Brand Name(s):	LG or GE
Model No.:	MZ-1246MG
FCC ID:	BEJX1241XGA

This device has been verified to comply with the applicable requirements in the FCC Part 18 and was tested in accordance with the measurement procedures specified in MP-5: 1985.
I assure full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Kwan Sung

Kwan Y. Sung / Chief Research Engineer
Digital Appliance Company, EMC Center
LG Electronics Inc.

REPORT FOR A MICROWAVE OVEN

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

EUT Type:	Microwave oven
Model No.:	MZ-1246MG
FCC ID:	BEJX1241XGA
Rule Part:	FCC Part 18
Test Procedure:	MP-5: 1985
Date of Test:	April 19, 2005 – April 19, 2005
Date of Issue:	April 20, 2005
Test Result:	Pass

The EMC Center facilities has been placed on file and the name of our organization added to the FCC's list for the FCC Part 15 and 18 of the Commission's Rules under Registration Number 93197.

Tested by:

Kwang M. Son / Research Engineer
Digital Appliance Company, EMC Center
LG Electronics Inc.

Reviewed by:

Kwan Y. Sung / Chief Research Engineer
Digital Appliance Company, EMC Center
LG Electronics Inc.

CONTENTS

1. CLIENT INFORMATION

The EUT has been tested by request of:

Company: (Manufacturer)	1. LG Electronics Inc. Cooking Appliances Division 391-2, Ga Eum Jeong - Dong, Changwon City, Gyeong Nam, 641-711, Korea 2. LG Electronics Tianjin Appliance Co., Ltd. Xing Dian Road, Bei Chen Distr., Tianjin 300402, People's Republic of China
Name of contact:	Jang Sup Lee
Telephone:	+82-551-260-3463
Fax:	+82-551-260-3223

2. EQUIPMENT UNDER TEST (EUT)

EUT is the LG Electronics Inc. Microwave Oven as followings:

Equipment:	Microwave oven
Model:	MZ-1246MG
Brand name:	LG or GE
Serial number:	N/A
Magnetron:	2M248J by Toshiba
RF Frequency:	2,450 MHz
RF Power Output (IEC 705):	950 W
Power Consumption	
Microwave Mode:	6300 W
Rated Input Voltage:	120 V~, 60 Hz
Rated Input Current	
Microwave Mode:	27.0 A
Cavity Volume:	1.2 Cu.ft
Oven Type:	Countertop / Household
Mode Stirrer:	Turntable
Power Cord:	Shielded
Outer Dimensions (inch)	29.8 (W) * 21.9 (H) * 18.0 (D)

EMI suppression device(s) installed in production: See schematics (Appendix C)
EMI suppression device(s) added and/or modified during test: None

3. TEST SITE

Measurement of radiated emissions from EUT was made at semi-anechoic chamber that has been in compliance with Federal Communications Commissions (FCC) requirements of clause 2.948 according to ANSI C63.4-1992 on March 21, 2003.

4. CALIBRATIONS OF MEASURING INSTRUMENT

All measurement was made with instruments calibrated according to the recommendation by manufacturer. Measurement of radiated emissions and power line conducted emissions were made with instruments conforming to American National Standard Specification, ANSI C63.4-1992. The calibration of measuring instrument, including any accessories that may affect test results, was performed according to the recommendation by manufacturer.

5. DESCRIPTION OF TEST CONDITION

5.1 Power line conducted emission measurements

Power line conducted emission measurements were based on the std. CISPR 11:1998+A1:1999.

5.1.1 Shielded enclosure

The measurement for power-line emissions from EUT was made in shielded enclosure that provides sufficient shielding effectiveness enough not to affect test results.

5.1.2 Detector function selection and bandwidth

During conducted emission measurement, a radio noise meter that has a CISPR quasi-peak detector with 10 kHz IF bandwidth of 6 dB was utilized.

5.1.3 Frequency range to be scanned

For conducted emissions measurement, frequency range of 150 kHz to 30 MHz included, was investigated.

5.1.4 Unit of measurement

Test results for conducted emissions are reported in micro-volt.

5.1.5 Line impedance stabilization network (LISN)

A LISN with characteristics that conform to the requirements of ANSI C63.4-1992 was used for the measurement of conducted power-line radio noise; (50 micro-henries / 50 ohms). Chassis and earth-points for grounding of the LISN were earth-grounded.

5.1.6 Test conditions and configuration of EUT

The EUT was configured and operated in all modes of operation so as to find the maximum enumeration of emissions from EUT.

The EUT has designed to use the public AC lines with rated AC voltage as specified in owner's manual and Installation's manual of EUT and filtered to meet the requirement. AC

power was supplied to the EUT through LISN with characteristics described in 5.1.5 of part I of this report.
The EUT was placed on a 1 m×1.5 m×40 cm high wooden table which is placed on the earth-grounded conducting surface larger than 2 square meter. The vertical conducting surface was replaced with horizontal ground plane. Length of the power lead in excess of 80 cm horizontally separating the EUT from LISN was folded back-and-forth form at the center of the power cord not exceeding 40 cm in length.
The EUT was operated with a load of 1000 ml water initially at 20 °C ± 5 °C placed at the center of the load-carrying surface.
Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurement to the typical usage and applicable as nearly as practicable.

5.1.7 Measurement uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above-mentioned way.

The measurement uncertainty was calculated in accordance with NAMAS NIS 81:
"The treatment of uncertainty in EMC measurement."
For calculated uncertainty of each item, refer the next page.

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

5.2 Radiated emissions measurement

5.2.1 Test site
Measurement was made in semi-anechoic chamber as described at Clause 3 in this report.

5.2.2 Detector function selection and bandwidth
In radiated emissions measurement, field strength meter that has CISPR quasi-peak and average detector was used. The bandwidth of the detector of instrument is 120 kHz for frequency range of 30 MHz – 1,000 MHz, and 1 MHz for frequency range of 1 GHz to 26 GHz. Emissions to be measured are detected in average mode.

5.2.3 Unit of measurement
Test results of radiated emissions measurement are reported in microvolts per meter at the specific distance. Using the unit of dBμV on the test instrument, the indication unit was converted to field strength unit of μV/m as following method;

$$F / S = 10^{\{(R+AF+CF)/20\}} \ (\mu V/m)$$

here,

F / S: Field Strength in μV/m, R: Meter Reading Level in dB(μV),
AF: Antenna Factor in dB/m
CF: Conversion Factor
  * 30 MHz ~ 1 GHz: CF = CL
  * Above 1 GHz: CF = CL – PG + FL + AL
CL: Cable Loss (dB) FL: Filter Loss (dB)
PG: Preamplifier Gain (dB) AL: Attenuator Loss (dB)

5.2.4 Antennas

Measurements were made using calibrated biconical antenna in range of 30 MHz to 300 MHz, log-periodic antenna in range of 300 MHz to 1,000 MHz and horn antenna in range of 1 to 26 GHz to determine the emission characteristics of the EUT. Measurements were also made for both horizontal and vertical polarization.

The horizontal distance between the receiving antenna and the closest periphery of the EUT was 3 meters for horn antenna and 10 meters for biconical and log-periodic antenna.

5.2.5 Frequency range to be scanned

For radiated emissions measurements, the spectrum in the range of 30 to 1,000 MHz and above, if found, was investigated.

5.2.6 Test conditions and configuration of EUT

The EUT was configured and operated in all modes of operation so as to find the maximum RF energy generated from EUT.

The power was furnished with rated (normal) AC 120 volts, as specified in the Owner's manual of EUT. The EUT was placed on a 1 m high non-metallic table. The turntable containing the system was rotated and the antenna height was varied 4 m to find the maximum RF energy detected from EUT.

Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurement to the typical usage and applicable as nearly as practicable.

5.2.7 Measurement uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in mentioned above way.

The measurement uncertainty was calculated in accordance with NAMAS NIS 81: "The treatment of uncertainty in EMC measurement."

For calculated uncertainty of each item, refer the next page.

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

< Fundamental Frequency Uncerntainty (2,450 MHz) >

Symbol	Contribution	Value (dB)		Probability Distribution	Divisor	Standard Uncertainty Horn Antenna (Value / Divisor)	Standard Uncertainty Squared
			3 m			3 m	3 m
V_1	Ambient signals				1	0.00	0.0
V_2	Antenna factor calibration	Expanded Uncertainty	0.5	normal (k = 2)	2	0.25	0.1
V_3	Cable loss calibration	Expanded Uncertainty	0.5	normal (k = 2)	2	0.25	0.1
V_4	Receiver specification	Tolerance	1.0	rectangular	1.732	0.58	0.3
V_5	Measurement distance variation	Tolerance	0.6	rectangular	1.732	0.35	0.1
V_6	Site imperfections	Tolerance	2.0	rectangular	1.732	1.15	1.3
V_7	Mismatch Receiver VRC: Γ_l = 0.33 Antenna VRC: Γ_g = 0.20 Uncertainty limits 20Log(1$\pm$ Γ_l Γ_g)	Tolerance	0.6	U-shaped	1.414	0.42	0.2
V_8	System repeatability (previous assessment of s(q_k) from 5 repeats, 1 reading on EUT Repeatability of EUT*		0.5	Std Deviation	1	0.50	0.3
	Combined standard uncertainty $u_c(y)$		1.53	normal			
	Expanded uncertainty U		3.06	normal (k = 2)			

$$u_c(y) = \sqrt{\left(\frac{0.0}{1}\right)^2 + \left(\frac{0.5}{2}\right)^2 + \left(\frac{0.5}{2}\right)^2 + \frac{1.0^2 + 0.6^2 + 2.0^2}{3} + \frac{0.6^2}{2} + 0.5^2}$$

The level of confidence will be approximately 95%. (The coverage factor: k=2)

$U = 2\,u_c(y) = 2 \times 1.53 = \pm 3.1$ dB

< Radiated Emission Uncerntainty (Above 1 GHz) >

Symbol	Contribution	Value (dB)		Probability Distribution	Divisor	Standard Uncertainty Horn Antenna (Value / Divisor)	Standard Uncertainty Squared
			3 m			3 m	3 m
V_1	Ambient signals			-	1	0.00	0.0
V_2	Antenna factor calibration #1	Expanded Uncertainty	0.5	normal (k = 2)	2	0.25	0.1
V_3	Antenna factor calibration #2	Expanded Uncertainty	0.5	normal (k = 2)	2	0.25	0.1
V_4	Cable loss calibration	Expanded Uncertainty	0.5	normal (k = 2)	2	0.25	0.1
V_5	Receiver specification	Tolerance	1.0	rectangular	1.732	0.58	0.3
V_6	Highpass filter	Tolerance	1.0	rectangular	1.732	0.58	0.3
V_7	Measurement distance variation	Tolerance	0.6	rectangular	1.732	0.35	0.1
V_8	Site imperfections	Tolerance	2.0	rectangular	1.732	1.15	1.3
V_9	Mismatch Receiver VRC: Γ_l = 0.33 Antenna VRC: Γ_g = 0.2 Uncertainty limits 20Log(1$\pm$ Γ_l Γ_g)	Tolerance	0.6	U-shaped	1.414	0.42	0.2
V_{10}	System repeatability (previous assessment of s(q_k) from 5 repeats, 1 reading on EUT Repeatability of EUT*		0.5	Std Deviation	1	0.50	0.3
	Combined standard uncertainty $u_c(y)$		1.65	normal			
	Expanded uncertainty U		3.31	normal (k = 2)			

$$u_c(y) = \sqrt{\left(\frac{0.0}{1}\right)^2 + \left(\frac{0.5}{2}\right)^2 + \left(\frac{0.5}{2}\right)^2 + \left(\frac{0.5}{2}\right)^2 + \frac{1.0^2 + 1.0^2 + 0.6^2 + 2.0^2}{3} + \frac{0.6^2}{2} + 0.5^2}$$

The level of confidence will be approximately 95%. (The coverage factor: k=2)

$U = 2\,u_c(y) = 2 \times 1.65 = \pm 3.4$ dB

< Electric Field Strength Uncerntainty (30 MHz – 1 GHz) >

Symbol	Contribution	Value (dB)		Probability Distribution	Divisor	Standard Uncertainty UltraLog Antenna (Value / Divisor)	Standard Uncertainty Squared
			10 m			10 m	10 m
V_1	Ambient signals			Std Deviation	1	0.00	0.0
V_2	Antenna factor calibration	Tolerance	1.0	rectangular	1.732	0.58	0.3
V_3	Cable loss calibration	Expanded Uncertainty	0.5	normal (k = 2)	2	0.25	0.1
V_4	Receiver specification	Tolerance	1.0	rectangular	1.732	0.58	0.3
V_5	Antenna directivity	Tolerance	3.0	rectangular	1.732	1.73	3.0
V_6	Antenna factor variation with height	Tolerance	0.5	rectangular	1.732	0.29	0.1
V_7	Antenna phase center variatior	Tolerance	0.2	rectangular	1.732	0.1	0.0
V_8	Antenna factor frequency interpolatior	Tolerance	0.25	rectangular	1.732	0.14	0.0
V_9	Measurement distance variation	Tolerance	0.4	rectangular	1.732	0.23	0.1
V_{10}	Site imperfections	Tolerance	2.0	rectangular	1.732	1.15	1.3
V_{11}	Mismatch Receiver VRC: Γ_l = 0.09 Antenna VRC: Γ_g = 0.33 Uncertainty limits 20Log(1$\pm$ Γ_l Γ_g)	Tolerance	0.3	U-shaped	1.414	0.21	0.0
V_{12}	System repeatability (previous assessment of s(q_k) from 5 repeats, 1 reading on EUT Repeatability of EUT*		0.5	Std Deviation	1	0.50	0.3
	Combined standard uncertainty $u_c(y)$		2.35	normal	2		
	Expanded uncertainty U		4.70	normal (k = 2)	2		

$$u_c(y) = \sqrt{\left(\frac{0.0}{1}\right)^2 + \left(\frac{0.5}{2}\right)^2 + \frac{1.0^2 + 1.0^2 + 3.0^2 + 0.5^2 + 0.2^2 + 0.25^2 + 0.4^2 + 2.0^2}{3} + \frac{0.30^2}{2} + 0.5^2}$$

The level of confidence will be approximately 95%. (The coverage factor: k=2)

U = 2 $u_c(y)$ = 2 x 2.35 = $\pm$ 4.7 dB

< Line Conducted Uncerntainty >

Symbol	Contribution	Value (dB)		Probability Distribution	Divisor	Standard Uncertainty (dB) 150 kHz - 30 MHz (Value / Divisor)	Standard Uncertainty Squared
V_1	Receiver specification	Tolerance	1.0	rectangular	1.732	0.58	0.3
V_2	LISN coupling specification	Tolerance	1.0	rectangular	1.732	0.58	0.3
V_3	Cable and input attenuator calibration	Expanded Uncertainty	0.5	normal (k = 2)	2	0.25	0.1
V_4	Mismatch Receiver VRC: Γ_l = 0.09 LISN VRC: Γ_g = 0.8 Uncertainty limits 20Log (1$\pm$ Γ_l Γ_g)	Tolerance	0.6	U-shaped	1.414	0.42	0.180
V_5	System repeatability (previous assessment of s(q_k) from 10 repeats, 1 reading on EUT)		0.35	standard deviation	1	0.35	0.12
	Combined standard uncertainty $u_c(y)$		1.02	normal			
	Expanded uncertainty U		2.03	normal (k = 2)			

$$u_c(y) = \sqrt{\frac{1.0^2 + 1.0^2}{3} + \left(\frac{0.5}{2}\right)^2 + \frac{0.6^2}{2} + 0.35^2} = \quad dB$$

The level of confidence will be approximately 95%. (The coverage factor: k=2)

U = 2 $u_c(y)$ = 2 x 1.02 = $\pm$ 2.1 dB

6. MEASURING INSTRUMENT

Instrument	Model	Cal. Due date	Serial No.	Control No.
Microwave Spectrum Analyzer	HP8566B	11/02/2005	3340A08173	99-IRE-05
RF Preselector	HP85685A	11/02/2005	3221A01441	99-IRE-04
Qusi-Peak Adapter	HP85650A	11/02/2005	3303A01732	99-TRE-01
R/B Spectrum Display	HP462	11/02/2005	3340A21397	99-IRE-02
Attenuator Switch Driver	HP11713A	11/02/2005	3334A11152	99-IRE-03
Preamplifier	HP8449B OPT H02	11/02/2005	3008A00525	99-IRE-06
Power Meter	HP436A	11/02/2005	2604A24567	99-IRE-12
Power Sensor	HP8481A	11/02/2005	2552A50829	99-IRE-14
Power Sensor	HP8482A	11/02/2005	2607A11242	99-IRE-15
Accessory Kit	-	-	7044/45-002	99-IRE-16
Horn Antenna	RGA-180 (Electro Metrics) RGA-60 (Electro Metrics) BBHA 9170 (Schwarz beck)	07/23/2005 07/22/2006 06/15/2005	2517 6104 168	99-IRE-22 99-IRE-21 03-IRE-34
Antenna Master	2070-2 (EMKO)	-	9903-2231	99-IRE-23
Ultra Log Antenna	HL562 (Chase)	06/09/2005	830547/007	99-IRE-27
High Pass Filter	11SH10-2500/X1800-010	11/02/2005	2	99-IRE-07
EMI Receiver	ESI26 (R&S) ESIB7 (R&S)	11/02/2005 06/28/2005	835336/008 100090	00-IRE-30 02-IRE-32
LISN	ESH2-Z5 (R&S) ENV4200 (R&S)	06/09/2005 11/01/2005	825640/003 100024	99-ICE-02 02-ICE-07
Microwave Cable	Sucoflex 104	-	125484/4	-
Microwave Cable	Sucoflex 106	-	13417/6	-
Microwave Cable	Sucoflex 106	-	13419/6	-
Microwave Cable	Sucoflex 106	-	13418/6	-
Microwave Cable	Sucoflex 104	-	125483/4	-
Microwave Cable	Sucoflex 104	-	12548/4	-
Microwave Cable	Sucoflex 106	-	13416/6	-
Microwave Cable	Sucoflex 106	-	13416/6	-
Semi Anechoic Chamber	YES INC.	-	-	99-CFA-01
Shield Screen Room	YES INC.	-	-	99-CFA-02
Microwave Survey Meter	Holaday HI-1710/HI-2623	07/24/2005	93083	FJZ431HA

7. TEST DATA

7.1 Input Power

The 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.

1) Magnetron type: 2M248J by Toshiba

Mode	Input Voltage	Current [A]	Power Consumption [W]	Manufacturer Rating [A]
Microwave	120 Vac, 60 Hz	14.7	1,635	27.0

7.2 RF Power Output Measurement according to MP-5.

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.

1) Magnetron type: 2M248J by Toshiba

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

Quantity of Water	Starting Temperature	Final Temperature	Elapsed Time
1,000 ml	20.6 °C	41.8 °C	120 Sec

$$\text{Power [W]} = \frac{4.187 * 1,000 * 21.2}{120}$$

Power [W] = 739.7 Watts

7.3 RF Power Output Measurement according to IEC 60705.

The test was performed according to the IEC Publication 60705/1999.
A cylindrical container of borosilicate glass was used. It has a maximum thickness of 3 mm, external diameter of approximately 190 mm and height of approximately 90 mm.
Water having an initial temperature of 10 °C ± 1 °C and quantity of 1000 g ± 5 g was used.
Before starting the measurement, measure the initial temperature of water.
And then the container was placed in the center of the oven. The oven was operated until attaining temperature of water as 20 °C ± 2 °C and then measured the final water temperature.
A mercury thermometer was used to measure temperature rise. The RF output power was calculated as below formula.

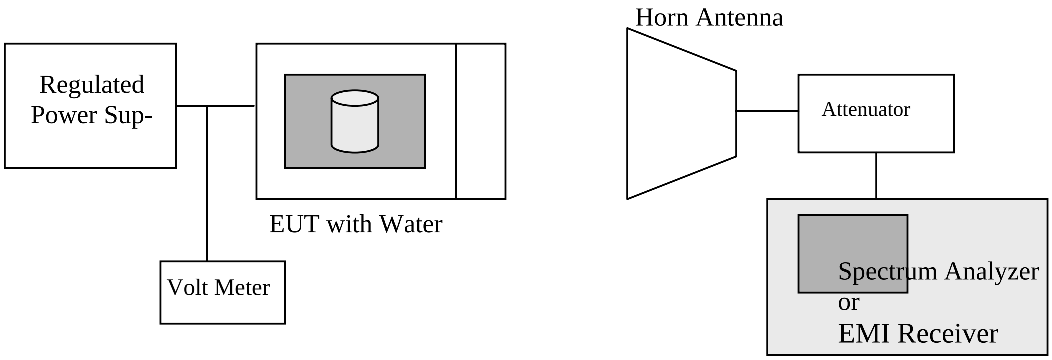
$$\text{Power [W]} = \frac{(4.187) * M_w * (T_2 - T_1) + 0.55 * M_c * (T_2 - T_0)}{t}$$

1) Magnetron type: 2M248J by Toshiba

M_w	:	Mass of the water, in grams	1000
M_c	:	Mass of the container, in grams	405
T_2	:	Final temperature of the water, in °C	20.1
T_1	:	Initial temperature of the water, in °C	9.9
T_0	:	Ambient temperature, in °C	24.7
t	:	Heating time in seconds, excluding the magnetron filament heat-up time.	44

$$\text{Power [W]} = \frac{4.187 * 1{,}000 * 10.2 + 0.55 * 405 * (-4.6)}{44} = \text{947.3 Watts}$$

7.4 Frequency measurements



1) Magnetron type: 2M248J by Toshiba

(1) Frequency vs Line Voltage Variation Test

Variation of line voltage from 80 % (96 V) to 125 % (150 V)
Load: 1,000 ml
Fundamental Frequency: 2,450 MHz
Limit: 2.4 GHz < f < 2.5 GHz

Maximum Frequency Observed:	2,465 MHz
Minimum Frequency Observed:	2,455 MHz
Result:	**Pass**

(2) Frequency vs Load Variation Test

Frequency was measured at the rated input voltage (AC 120 V).
Initial Load: 1,000 ml
Final Load: 200 ml
Fundamental Frequency: 2,450 MHz
Limit: 2.4 GHz < f < 2.5 GHz

Maximum Frequency Observed:	2,472 MHz
Minimum Frequency Observed:	2,455 MHz
Result:	**Pass**

7.5 Power Density Safety Check

The power density was check to ensure that the power is not greater than 1.0 mW/㎠ at any location of the oven. The 1.0 mW/㎠ is in accordance with CDRH and UL923 standard.

A microwave survey meter was placed on all sides, door and viewing, bottom, top and rear. No power greater than 0.10 mW/㎠ was observed and did not exceed the specified limits.

1) Magnetron type: 2M248J by Toshiba

Maximum Leakage Microwave Observed: 0.08 ***mW/㎠***

Result: Pass

7.6 Conducted emissions (Section 18.307)

Conducted emission was measured at a frequency range 150 kHz to 30 MHz. The Power Line disturbance voltage was measured with the equipment under test (EUT) in a shielded room. The EUT was connected to a line impedance stabilization network (LISN) placed on the floor. The EUT was placed on a non-metallic table 0.4 m above the metallic, grounded floor. The distance to other metallic surfaces was at least 0.4 m.
The line conducted emission measurement procedure and test configuration is based on CISPR 11:1998 and Amendment 1:1999.
Amplitude measurements were performed with a quasi-peak detector and, if required, with an average detector.

Below data are the highest levels in Microwave mode.
An overview sweep performed with peak detector is included in the APPENDIX A (Test Plot).

1) Magnetron type: 2M248J by Toshiba

	Quasi-Peak			Average		
Frequency [MHz]	Disturbance Level [dBuV]	Permitted Limit [dBuV]	Margin [dB]	Disturbance Level [dBuV]	Permitted Limit [dBuV]	Margin [dB]
0.150	24.9	66.0	-41.1	3.6	56.0	-52.4
1.630	39.2	56.0	-16.8	3.3	46.0	-42.7
16.010	38.5	60.0	-21.5	37.8	50.0	-12.2
25.050	36.2	60.0	-23.8	35.7	50.0	-14.3

Remark: 1. “<<” means that disturbance level is lower than 20 dB below the limit.

7.7 Radiated emissions (Section 18.305)

Radiated emission was measured at a frequency range 30 MHz to 26 GHz. The EUT was supported by a 1 m high wood table, measurement above 1 GHz and below 1 GHz.
Preliminary measurements were made inside an anechoic chamber at 3 m to determine to emission characteristics of EUT. The EUT is configured and operated in a manner, which produces the maximum emission in a typical configuration. Final measurements were made outdoor in control room at 3-meter test method.

1) Magnetron type: 2M248J by Toshiba

Test distance: 3 m

Freq. [MHz]	Ant. Factor [dB]	Cable Loss [dB]	Load [ml]	Load Location	Meter Reading [dBuV]	Field Strength @ 3 m [dBuV/m]	Field Strength @ 3 m [uV/m]	Field Strength @ 300 m [uV/m]	FCC Limit @ 300 m [uV/m]
2,399	28.8	3.8	700	Center	26.5	59.1	901.6	9.0	30.4
2,532	29.1	3.8	700	Center	24.3	57.2	724.4	7.2	30.4
4,926	33.7	6.1	700	Center	10.9	50.7	342.8	3.4	30.4
4,897	33.7	6.1	700	Rt. Front	6.2	46.0	199.5	2.0	30.4
4,900	33.7	6.1	300	Center	6.5	46.3	206.5	2.1	30.4
4,890	33.7	6.1	300	Rt. Front	3.3	43.1	142.9	1.4	30.4
7,386	36.6	7.5	700	Center	0.1	44.2	162.2	1.6	30.4
7,333	36.6	7.5	700	Rt. Front	0.9	45.0	177.8	1.8	30.4
7,312	36.6	7.5	300	Center	-2.1	42.0	125.9	1.3	30.4
7,340	36.6	7.5	300	Rt. Front	1.3	45.4	186.2	1.9	30.4
9,793	38.3	8.7	700	Center	-4.9	42.1	127.4	1.3	30.4
14,745	40.2	14.5	700	Center	-0.7	54.0	501.2	5.0	30.4
17,200	43.8	15.2	700	Center	-3.8	55.2	575.4	5.8	30.4

Other frequencies: No detected.
For measurement of 30 MHz – 1,000 MHz, refer to APPENDIX A (Test Plot).

Result: Pass

* 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 $^{[\text{Field strength at 3m(dBuV/m)}/20]}$

NOTES:

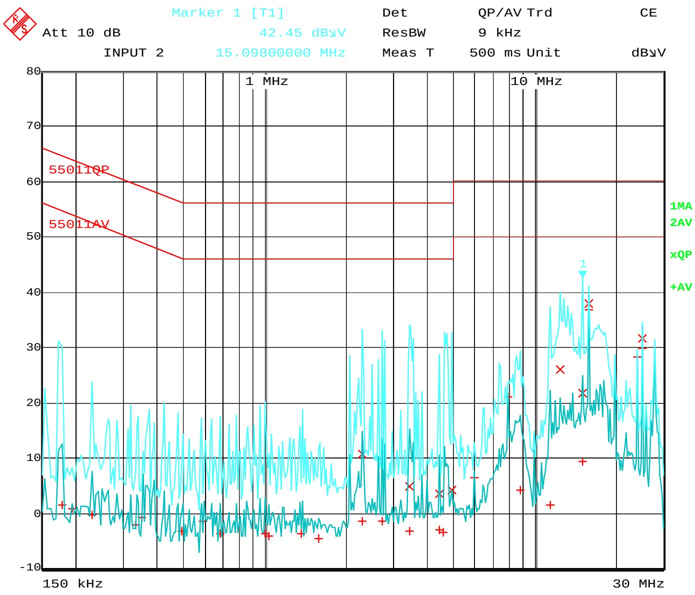
1. Two representative modes (full power and defrost) of operation were investigated.
2. A glass beaker was used as the container and the test was made with a shelf in its initial normal position.
3. Load for measurement of radiation on second and third harmonic: Two loads, one of 700 and the other of 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.
4. Load for all other measurements: 700 ml of water, with the beaker located in the center of the oven
5. All other emissions are non-significant.
6. The tests were made with average detector for frequency range of 30 MHz to 26 GHz.

APPENDIX A. Test Plot

♦ 150 kHz ~ 30 MHz (Magnetron type: 2M248J by Toshiba)

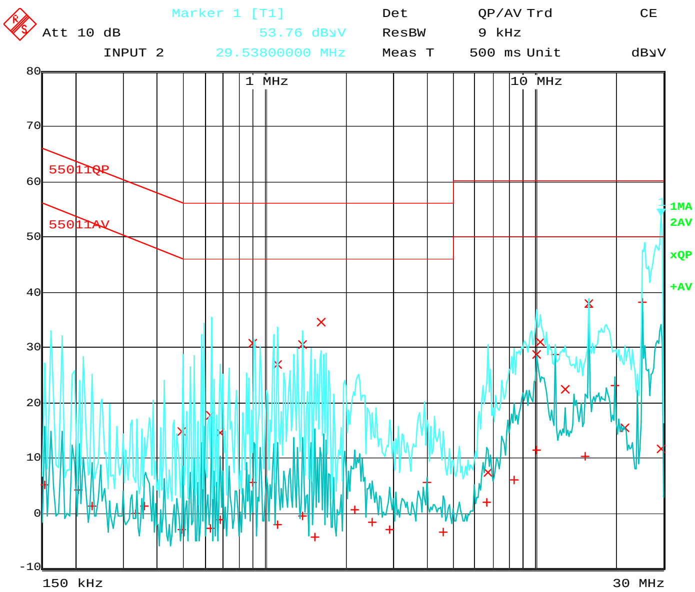
- Operating Mode: Maximum RF Power Output
- Detect Mode: Quasi-Peak(x)/Average(+), Scan Mode: Peak

<Phase: L1>



Title: MZ-1246MG
Comment B: MGT:2M248
L Phase
Date: 19.APR.2005 17:55:31

<Phase: N>

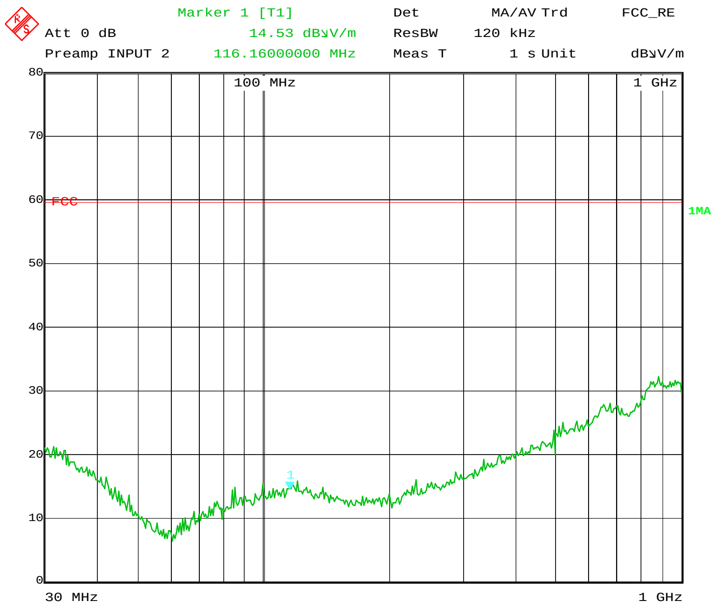


Title: MZ-1246MG
Comment B: MGT:2M248
N Phase
Date: 19.APR.2005 17:52:15

♦ 30 MHz ~ 1000 MHz (Magnetron type: 2M248J by Toshiba)

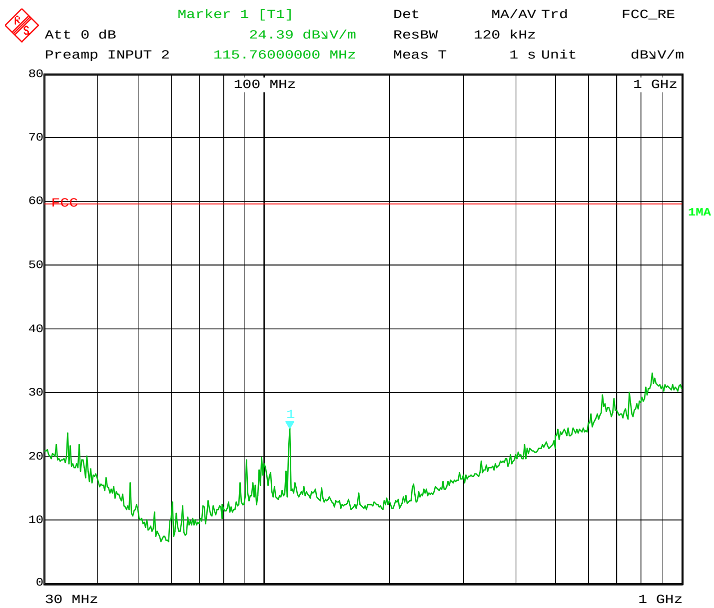
- Operating Mode: Maximum RF Power Output
- Detect Mode: Peak
- Measurement Distance: 10 meters

<Antenna Polarization: Horizontal>



Title: MZ-1246MG
Comment B: MGT.: 2M248J & ANT. HOR.
Date: 19.APR.2005 15:58:04

<Antenna Polarization: Vertical>

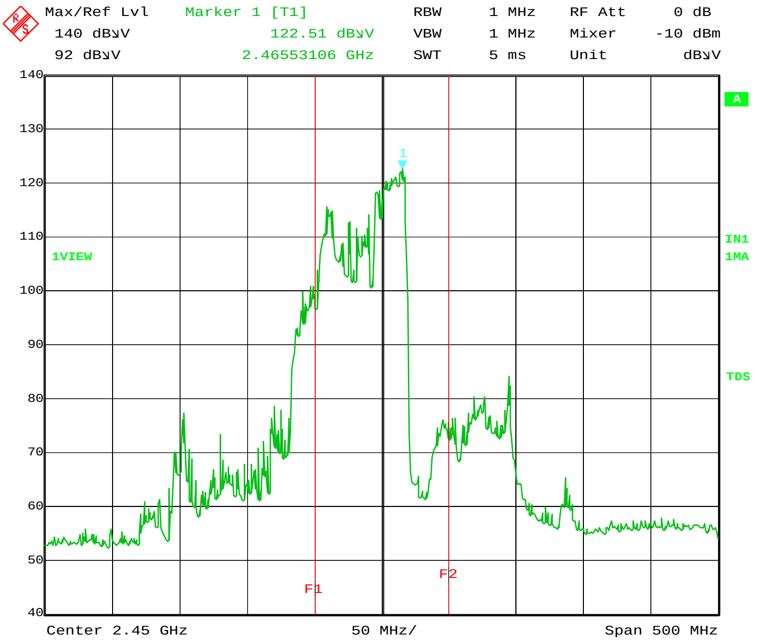


Title: MZ-1246MG
Comment B: MGT.: 2M248J & ANT. VER.
Date: 19.APR.2005 15:56:22

♦ **Voltage Variation (Magnetron type: 2M248J by Toshiba)**

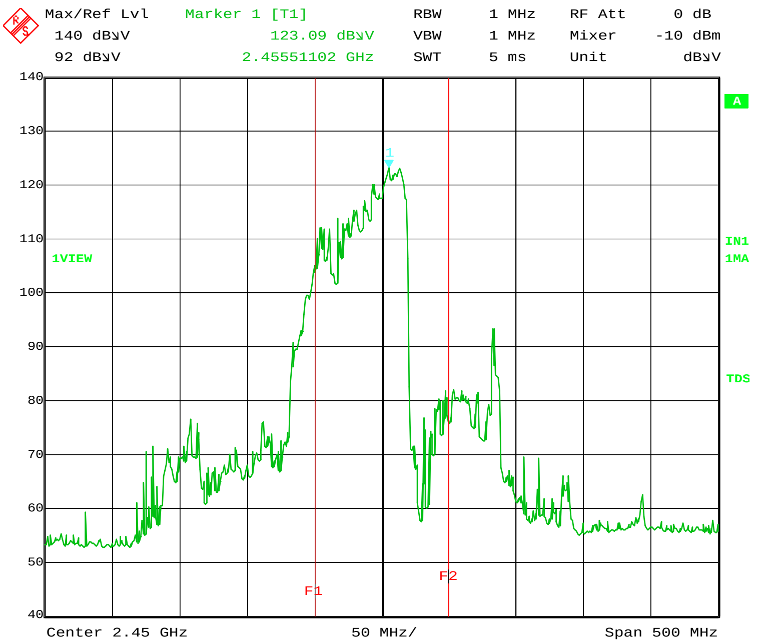
- Detect Mode: Average,   Scan Mode: Peak

<Maximum Frequency Observed: 2,465 MHz>



Title: MZ-1246MG
Comment A: MGT.: 2M248J & 108 V
Date: 19.APR.2005 14:08:52

<Minimum Frequency Observed: 2,455 MHz>

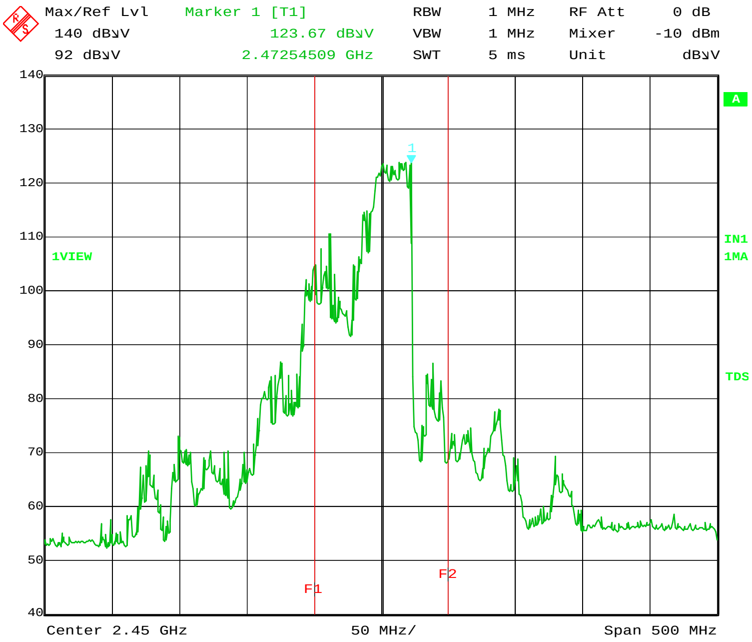


Title: MZ-1246MG
Comment A: MGT.: 2M248J & Fund. Freq.
Date: 19.APR.2005 13:11:33

♦Load Variation (Magnetron type: 2M248J by Toshiba)

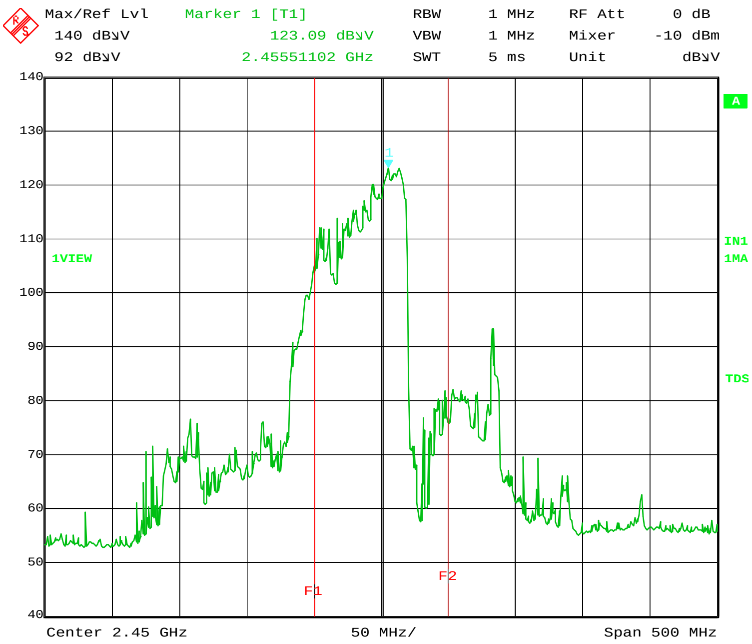
- Detect Mode: Average,   Scan Mode: Peak

<Maximum Frequency Observed: 2,472 MHz >



Title: MZ-1246MG
Comment A: MGT.: 2M248J & 200 ml
Date: 19.APR.2005 13:45:47

< Minimum Frequency Observed: 2,455 MHz >



Title: MZ-1246MG
Comment A: MGT.: 2M248J & Fund. Freq.
Date: 19.APR.2005 13:11:33

APPENDIX B. Labeling Requirements

Labeling requirements per Section 2.925 and 15.19.

The label shown shall be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time purchase.

LG MICROWAVE OVEN (HOUSEHOLD)

MODEL NO. MZ-1246MG
CATALOG NO.
INPUT 120/240 V 27.0 A SINGLE PHASE
WITH GROUNDING 60Hz AC
OUTPUT FREQUENCY 2450MHz
COMPLIES WITH DHHS RADIATION PERFORMANCE
STANDARDS 21CFR SUBCHAPTER J.
MANUFACTURED: SERIAL NO:

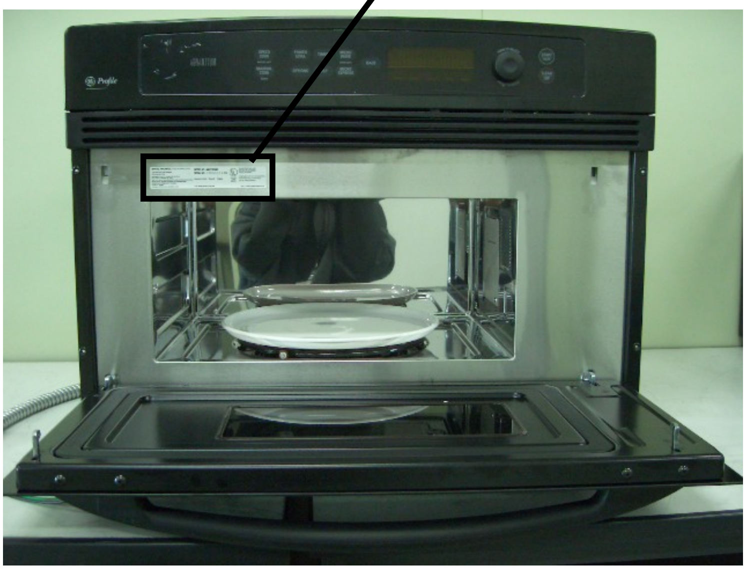
DHHS CODE NO.: GC
FCC ID: BEJX1241XGA
MADE IN KOREA

LISTED

Distributed by LG Electronics USA

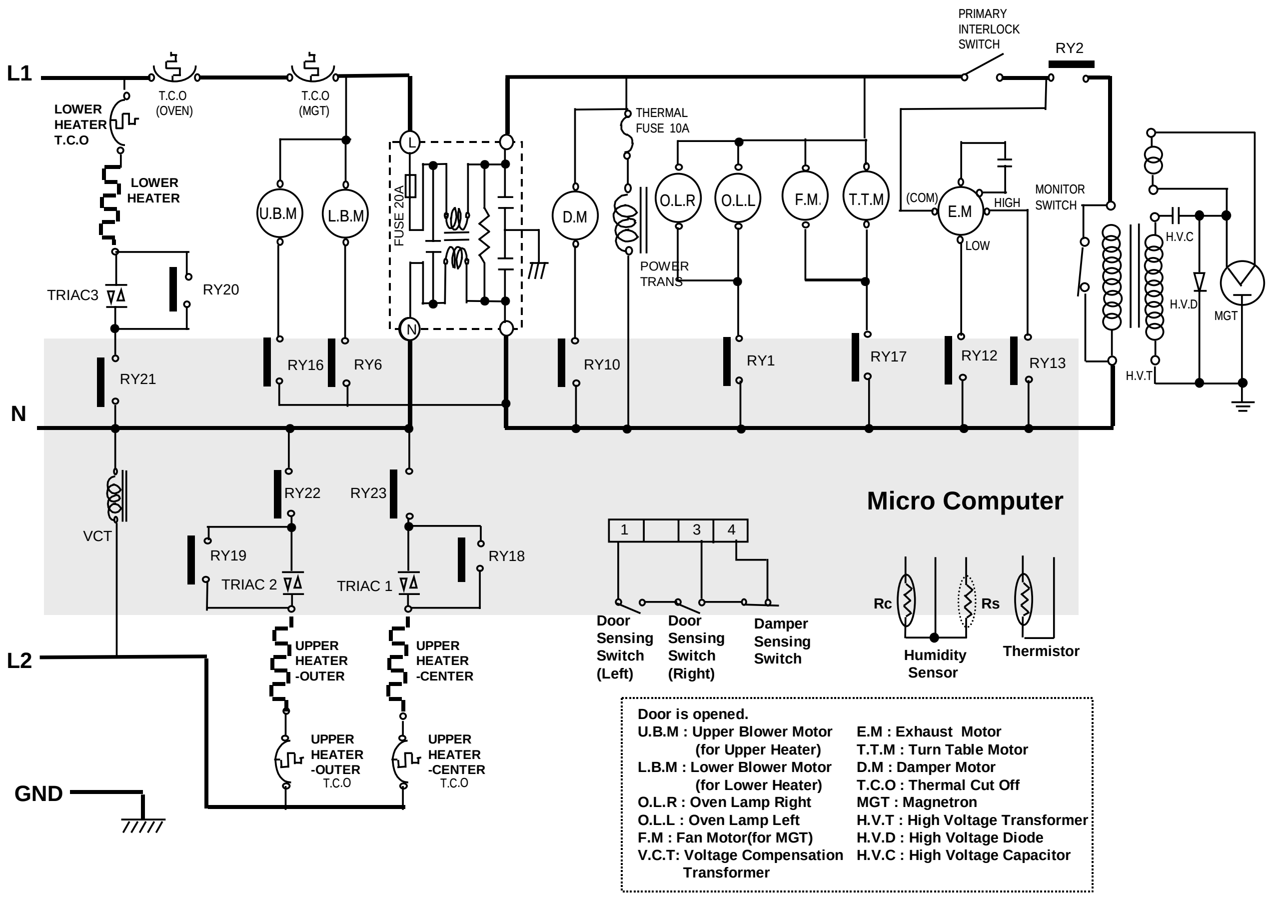
<Fig. 1. Sample Label of Nameplate>

* Alternate location:
The nameplate may be alternatively affixed on the left side of control panel or internal surface of oven cavity or rear surface of oven.



< Fig. 2. Photo of the physical location of the label>

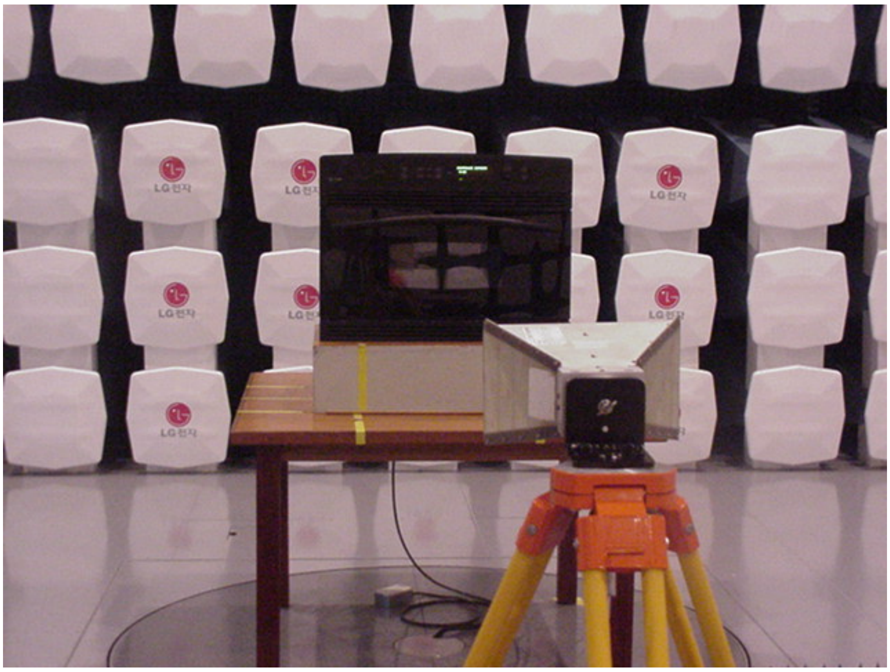
APPENDIX C. Block Diagram / Schematics

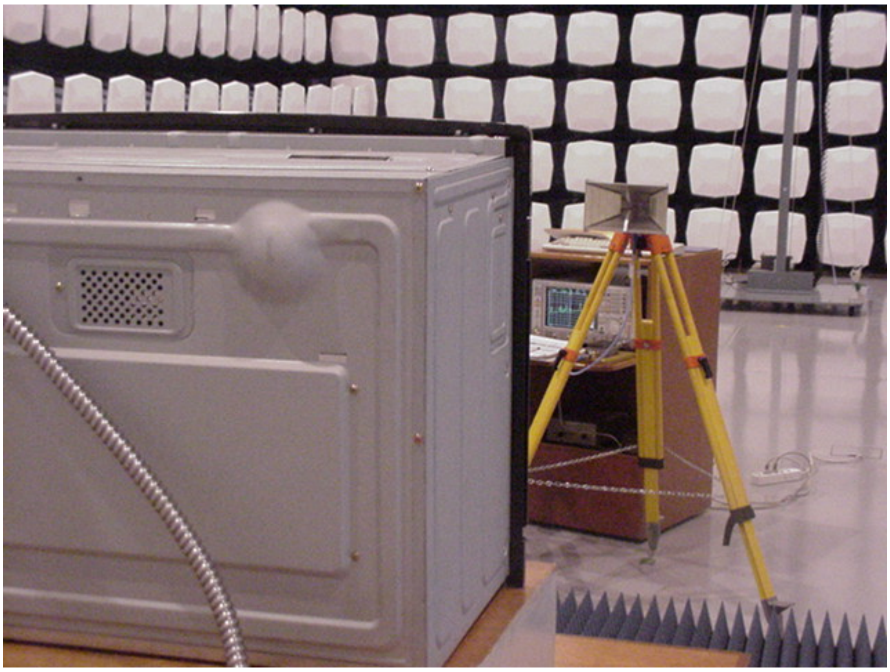


<Fig. 3. Schematic Diagram>

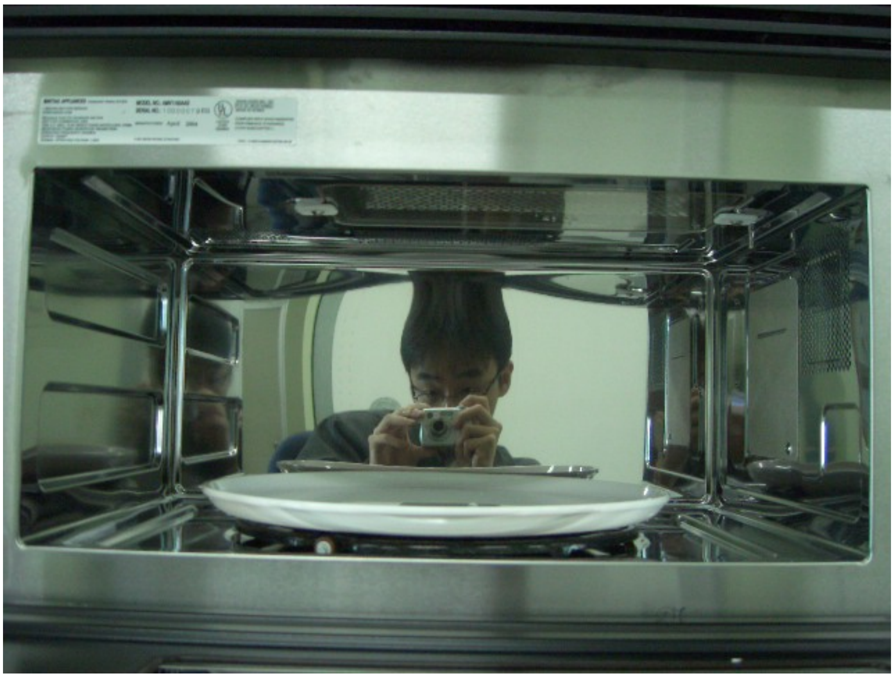
APPENDIX D. Test Photos

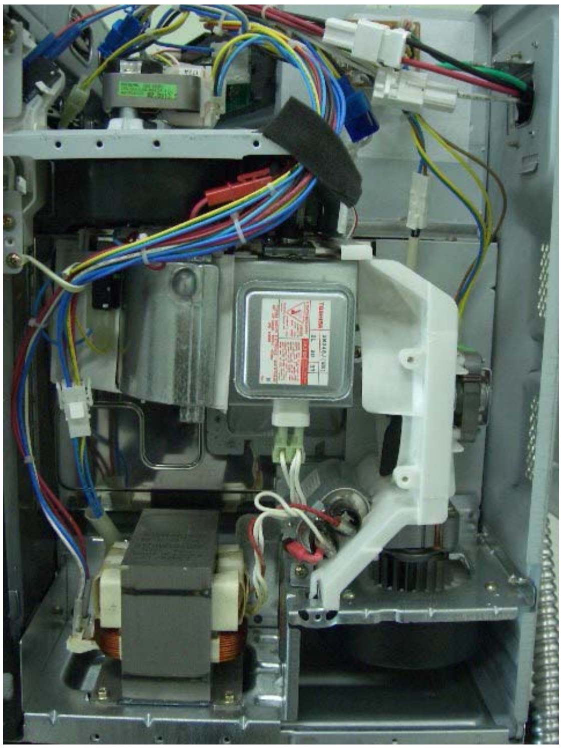
Test photos show the worst case configuration and cable placement with a minimum margin to the specifications.

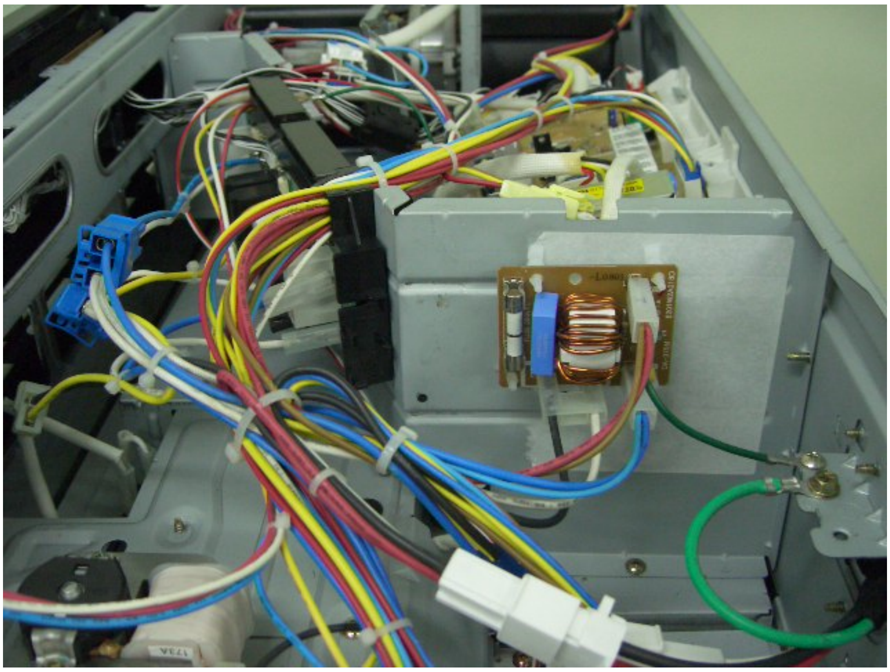


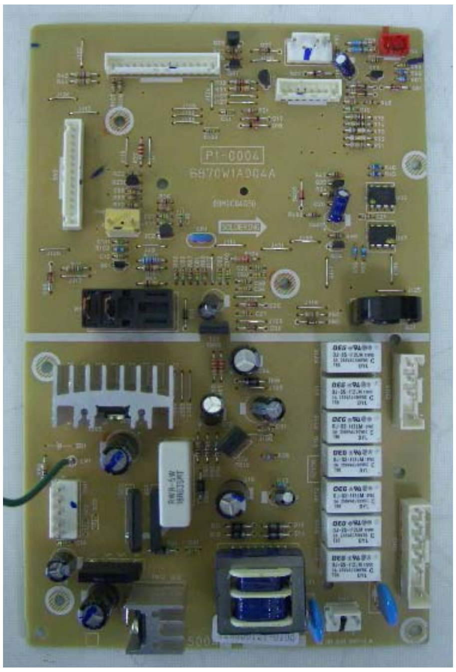


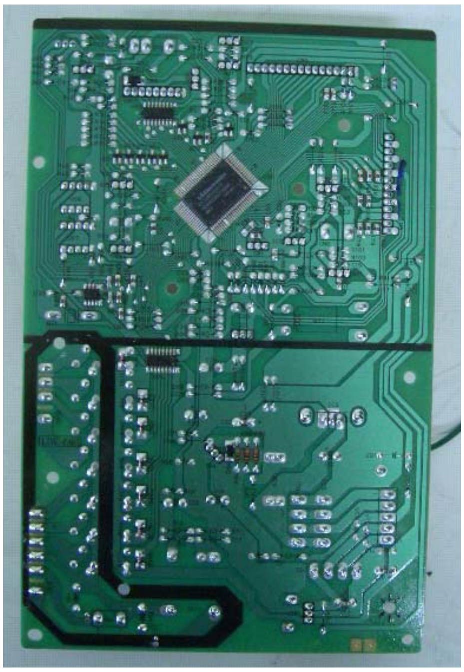
APPENDIX E. EUT Photos











APPENDIX F. Owner's Manual with regard to FCC Instruction

SAFETY

- **To avoid improperly cooking some foods.**
  - **Do not heat any types of baby bottles or baby food.** Uneven heating may occur and possibly cause personal injury.
  - **Do not heat small-necked containers,** such as syrup bottles.
  - **Do not deep-fat fry in your microwave oven.**
  - **Do not attempt home canning in your microwave oven.**
  - **Do not heat the following items in the microwave oven:** whole eggs in the shell, water with oil or fat, sealed containers, or closed glass jars. These items may explode.
- Do not cover or block any openings in the oven.
- Use your oven only for the operations described in this manual.
- Do not run the oven empty, without food in it.
- Do not let cord hang over edge of table or counter.
- **Preserve the oven floor:**
  - **Do not heat the oven floor excessively.**
  - **Do not** allow the gray film on special microwave-cooking packages to touch the oven floor. Put the package on a microwavable dish.
  - **Do not** cook anything directly on the oven floor or turntable. Use a microwavable dish.
  - Keep a browning dish at least 3/16 inch above floor. Carefully read and follow the instructions for the browning dish. If you use a browning dish incorrectly, you could damage the oven floor.
- Install or locate this appliance only in accordance with the provided installation instructions.
- This appliance should be serviced only by qualified service personnel. Contact the nearest authorized service facility for examination, repair, or adjustment.

SAVE THESE INSTRUCTIONS

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT (U.S.A. ONLY)

⚠ WARNING:

This equipment generates and uses ISM frequency energy and if not installed and used properly, that is in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with limits for ISM Equipment pursuant to part 18 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following:

- Reorient the receiving antenna of the radio or television.
- Relocate the Microwave Oven with respect to the receiver.
- Move the microwave oven away from the receiver.
- Plug the microwave oven into a different outlet so that the microwave oven and the receiver are on different branch circuits.

The manufacturer is not responsible for any radio or TV interference caused by **unauthorized modification** to this microwave oven. It is the responsibility of the user to correct such interference.