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 : January 14, 2003 **Test Report No: 03-LAE-M011**
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:	2M246 (LG Electronics Inc.) 2M248J (Toshiba Hokuto Electronics Corp.)
Brand Name(s):	Goldstar or LG
Model No.:	MV-1642GT
FCC ID:	BEJV164XK

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 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.:	MV-1642GT
FCC ID:	BEJV164XK
Rule Part:	FCC Part 18
Test Procedure:	MP-5: 1985
Date of Test:	Jan. 06, 2003 – Jan. 13, 2003
Date of Issue :	Jan. 14, 2003
Test Result:	Pass

EMC Center authorizes the above-named applicant to reproduce this report provided it is reproduced in its entirety.

EMC Center reports apply only to the specific sample(s) tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production unit of this model are manufactured with identical electrical and mechanical components.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval.

This report must not be used by the client to claim product endorsement by any agency of the U.S. Government.

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:

Dong H. Kim / 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

Page

1. CLIENT INFORMATION....3

2. EQUIPMENT UNDER TEST (EUT)....3

3. TEST SITE....4

4. CALIBRATIONS OF MEASURING INSTRUMENT....4

5. DESCRIPTION OF TEST CONDITION....4

5.1 RADIATED EMISSIONS MEASUREMENT....4

6. MEASURING INSTRUMENT....8

7. TEST DATA....9

7.1 INPUT POWER....9
7.2 RF POWER OUTPUT MEASUREMENT....10
7-3. FREQUENCY MEASUREMENTS....11
7-4. POWER DENSITY SAFETY CHECK....13
7-5. RADIATED EMISSIONS (SECTION 18.305)....14

APPENDIX A. TEST PLOT....16

APPENDIX B. LABELING REQUIREMENTS....22

APPENDIX C. BLOCK DIAGRAM / SCHEMATICS....23

APPENDIX D. TEST PHOTOS....24

APPENDIX E. EUT PHOTOS....26

APPENDIX F. OWNER'S MANUAL WITH REGARD TO FCC INSTRUCTION....30

1. CLIENT INFORMATION

The EUT has been tested by request of:

Company:	LG Electronics Inc. Cooking Appliances Division 391-2, Ga Eum Jeong - Dong, Changwon City, Gyeong Nam, 641-711, Korea
Name of contact:	Gyu Sik Cho
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:	MV-1642GT
Brand name:	GoldStar or LG
Serial number:	N/A
Magnetron:	2M246 by LG Electronics Inc. 2M248J by Toshiba Hokuto Electronics Corp.
RF Frequency:	2,450 MHz
RF Power Output(IEC 705):	1,000 W
Power Consumption Microwave Mode:	 1,500 W
Rated Input Voltage:	120 V~, 60 Hz
Rated Input Current Microwave Mode:	 13.0 A
Cavity Volume:	1.6 Cu.ft
Oven Type:	Wall-mount or Over The Range / Household
Mode Stirrer:	Turntable
Power Cord:	Unshielded
Outer Dimensions(inch)	29.94 (W) * 16.18 (H) * 15.15 (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 April 17, 2000.

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 Radiated emissions measurement

5.1.1 Test site

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

5.1.2 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 10 GHz. Emissions to be measured are detected in average mode.

5.1.3 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)

5.1.4 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 10 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.

5.1.5 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.

5.1.6 Test conditions and configuration of EUT

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

5.1.7 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 Uncertainty (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: $\Gamma_l = 0.33$ Antenna VRC: $\Gamma_g = 0.20$ Uncertainty limits 20Log(1± 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)

$U = 2\,u_c(y) = 2 \times 1.53 = \pm 3.1$ *d*B

< Radiated Emission Uncertainty (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: $\Gamma = 0.33$ Antenna VRC: $\Gamma_g = 0.2$ Uncertainty limits 20Log(1± 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)

$U = 2\,u_c(y) = 2 \times 1.65 = \pm 3.4$ *d*B

< Electric Field Strength Uncertainty (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 calibratior	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: $\Gamma_l = 0.09$ Antenna VRC: $\Gamma_g = 0.33$ Uncertainty limits 20Log(1+ 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)

$U = 2\,u_c(y) = 2 \times 2.35 = +4.7$ *d*B

< Line Conducted Uncertainty >

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: $\Gamma_l = 0.09$ LISN VRC: $\Gamma_g = 0.8$ Uncertainty limits 20Log (1+ 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)			

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

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

$U = 2\,u_c(y) = 2 \times 1.02 = \pm 2.1$ *d*B

6. MEASURING INSTRUMENT

Instrument	Model	Cal. Due date	Serial No.	Control No.
Microwave Spectrum Analyzer	HP8566B	10/26/2003	3340A08173	99-IRE-05
RF Preselector	HP85685A	10/26/2003	3221A01441	99-IRE-04
Qusi-Peak Adapter	HP85650A	10/26/2003	3303A01732	99-TRE-01
R/B Spectrum Display	HP462	10/26/2003	3340A21397	99-IRE-02
Attenuator Switch Driver	HP11713A	10/26/2003	3334A11152	99-IRE-03
Preamplifier	HP8449B OPT H02	10/26/2003	3008A00525	99-IRE-06
Power Meter	HP436A	10/11/2003	2604A24567	99-IRE-12
Power Sensor	HP8481A	10/24/2003	2552A50829	99-IRE-14
Power Sensor	HP8482A	10/24/2003	2607A11242	99-IRE-15
Accessory Kit	-	-	7044/45-002	99-IRE-16
Horn Antenna	RGA-180 (Electro Metrics) RGA-60 (Electro Metrics)	07/03/2003 05/22/2004	2517 6104	99-IRE-22 99-IRE-21
Antenna Master	2070-2(EMKO)	-	9903-2231	99-IRE-23
Ultra Log Antenna	HL562(Chase)	05/19/2003	830547/007	99-IRE-27
High Pass Filter	11SH10- 2500/X1800-010	06/06/2003	2	99-IRE-07
EMI Receiver	ESI26 (R&S)	10/26/2003	835336/008	00-IRE-30
LISN	ESH2-Z5(R&S)	05/15/2003	825640/003	99-ICE-02
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	09/21/2003	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: 2M246 by LG

Mode	Input Voltage	Current [A]	Power Consumption [W]	Manufacturer Rating [A]
Microwave	120 Vac, 60 Hz	13.3	1,507	13.0

2) Magnetron type: 2M248J by Toshiba

Mode	Input Voltage	Current [A]	Power Consumption [W]	Manufacturer Rating [A]
Microwave	120 Vac, 60 Hz	13.4	1,519	13.0

7.2 RF Power Output Measurement

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 described in MP-5 and IEC Publication 705/1998.

1) Magnetron type: 2M246 by LG

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

Quantity of Water	Starting Temperature	Final Temperature	Elapsed Time
1000 ml	18.5 °C	40.0 °C	120 Sec

$$\text{Power [W]} = \frac{4.187 * 1000 * 21.5}{120}$$

Power [W] = 750.1 Watts

2) Magnetron type: 2M248J by Toshiba

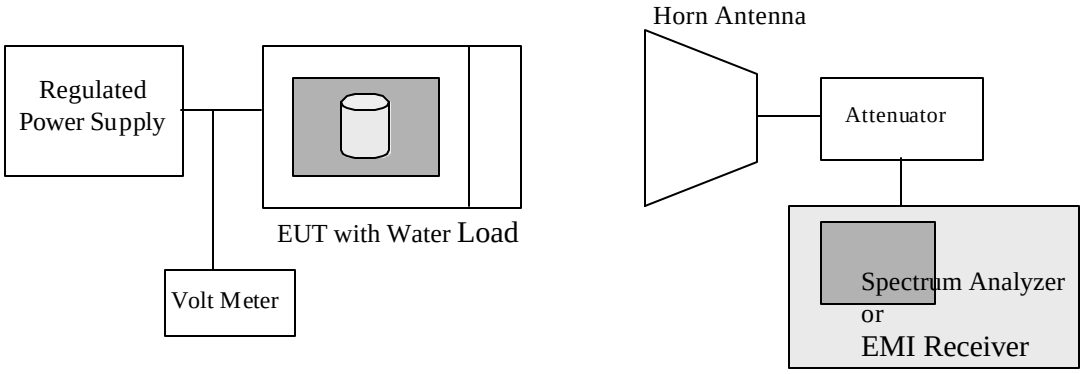
$$\text{Power [W]} = \frac{(4.187\ \text{Joules/Cal}) * (\text{Volume in ml}) * (\text{Temperature Rise})}{\text{Time in Seconds}}$$

Quantity of Water	Starting Temperature	Final Temperature	Elapsed Time
1000 ml	17.7 °C	39.6 °C	120 Sec

$$\text{Power [W]} = \frac{4.187 * 1000 * 21.9}{120}$$

Power [W] = 764.1 Watts

7-3. Frequency measurements



1) Magnetron type: 2M246 by LG

(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:	2,475 MHz
Minimum Frequency Observed:	2,437MHz
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:	2,474 MHz
Minimum Frequency Observed:	2,442 MHz
Result:	**Pass**

2) Magnetron type: 2M248J by Toshiba

(2) Frequency vs. Line Voltage Variation Test

Variation of line voltage from 80 % (96 V) to 125 % (150 V)
Load: 1000 ml
Fundamental Frequency: 2,450 MHz
Limit: 2.4 GHz < f < 2.5 GHz

Maximum Frequency Observed:	2,468 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: 1000 ml
Final Load: 200 ml
Fundamental Frequency: 2,450 MHz
Limit: 2.4 GHz < f < 2.5 GHz

Maximum Frequency Observed:	2,470 MHz
Minimum Frequency Observed:	2,446 MHz
Result:	**Pass**

7-4. 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 0.12 mW/㎠ was observed and did not exceed the specified limits.

1) Magnetron type: 2M246 by LG

Maximum Leakage Microwave Observed: 0.10 ***mW/㎠***

Result: **Pass**

2) Magnetron type: 2M248J by Toshiba

Maximum Leakage Microwave Observed: 0.12 ***mW/㎠***

Result: **Pass**

7-5. Radiated emissions (Section 18.305)

Radiated emission was measured at a frequency range 30 MHz to 10 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: 2M246 by LG

Test distance: 3 m

Freq. (MHz)	Ant. Factor [dB]	Cable Loss [dB]	Load [ml]	Load Location	Meter Reading [dBμV]	Field Strength @ 3 m [dBμV/m]	Field Strength @ 3 m [μV/m]	Field Strength @ 300 m [μV/m]	FCC Limit @ 300 m [μV/m]
2,392	28.5	4.3	700	Center	21.4	54.2	512.9	5.1	30.6
2,512	28.8	4.3	700	Center	15.9	49.0	281.8	2.8	30.6
4,902	33.0	6.3	700	Center	20.7	60.0	1000.0	10.0	30.6
4,902	33.0	6.3	700	Rt. Front	21.7	61.0	1122.0	11.2	30.6
4,907	33.0	6.3	300	Center	19.9	59.2	912.0	9.1	30.6
4,910	33.0	6.3	300	Rt. Front	18.8	58.1	803.5	8.0	30.6
7,398	36.7	8.9	700	Center	6.5	52.1	402.7	4.0	30.6
7,399	36.7	8.9	700	Rt. Front	4.9	50.5	335.0	3.3	30.6
7,412	36.7	8.9	300	Center	8.5	54.1	507.0	5.1	30.6
7,397	36.7	8.9	300	Rt. Front	7.5	53.1	451.9	4.5	30.6
9,898	38.7	9.7	700	Center	5.7	54.1	507.0	5.1	30.6

For measurement of 30 MHz – 1000 MHz, refer to APPENDIX A (Test Plot).

2) Magnetron type: 2M248J by Toshiba

Test distance: 3 m

Freq. (MHz)	Ant. Factor [dB]	Cable Loss [dB]	Load [ml]	Load Location	Meter Reading [dBμV]	Field Strength @ 3 m [dBμV/m]	Field Strength @ 3 m [μV/m]	Field Strength @ 300 m [μV/m]	FCC Limit @ 300 m [μV/m]
2,390	28.5	4.3	700	Center	18.4	51.2	363.1	3.6	30.9
2,516	28.8	4.3	700	Center	16.4	49.5	298.5	3.0	30.9
4,893	33.0	6.3	700	Center	12.7	52.0	398.1	4.0	30.9
4,928	33.0	6.3	700	Rt. Front	13.9	53.2	457.1	4.6	30.9
4,895	33.0	6.3	300	Center	13.2	52.5	421.7	4.2	30.9
4,905	33.0	6.3	300	Rt. Front	13.7	53.0	446.7	4.5	30.9
7,354	36.7	8.9	700	Center	4.4	50.0	316.2	3.2	30.9
7,359	36.7	8.9	700	Rt. Front	5.6	51.2	363.1	3.6	30.9
7,354	36.7	8.9	300	Center	4.4	50.0	316.2	3.2	30.9
7,360	36.7	8.9	300	Rt. Front	6.4	52.0	398.1	4.0	30.9
9,799	38.7	9.7	700	Center	4.8	53.2	457.1	4.6	30.9

For measurement of 30 MHz – 1000 MHz, refer to APPENDIX A (Test Plot).

Result: Pass

* Limit (at 300m) = 25 * (RF Power/500)$^{1/2}$ (μV/m)

* Field Strength below 1000 MHz (at 300m) (μV/m) = 10 $^{[(\text{Field strength at 10m(dBuV/m)-29.5})/20]}$

* Field Strength above 1000 MHz (at 300m) (μV/m) = K * 10 $^{[\text{Field strength at 3m(dBuV/m)}/20]}$

NOTES:

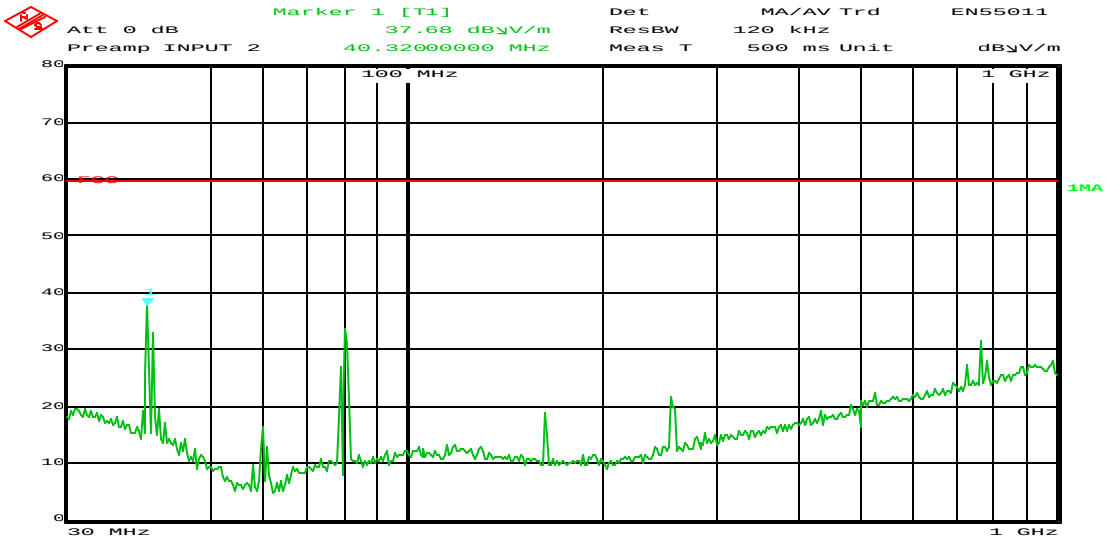
1. Two representative modes (full power and defrost) of operation were investigated.
2. A glass beaker was used as the container and the test was made with a shelf in its initial normal position.
3. Load for measurement of radiation on second and third harmonic: Two loads, one of 700 and the other of 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 10 GHz.

APPENDIX A. Test Plot

♦ 30 MHz ~ 1000 MHz (Magnetron type: 2M246 by LG)

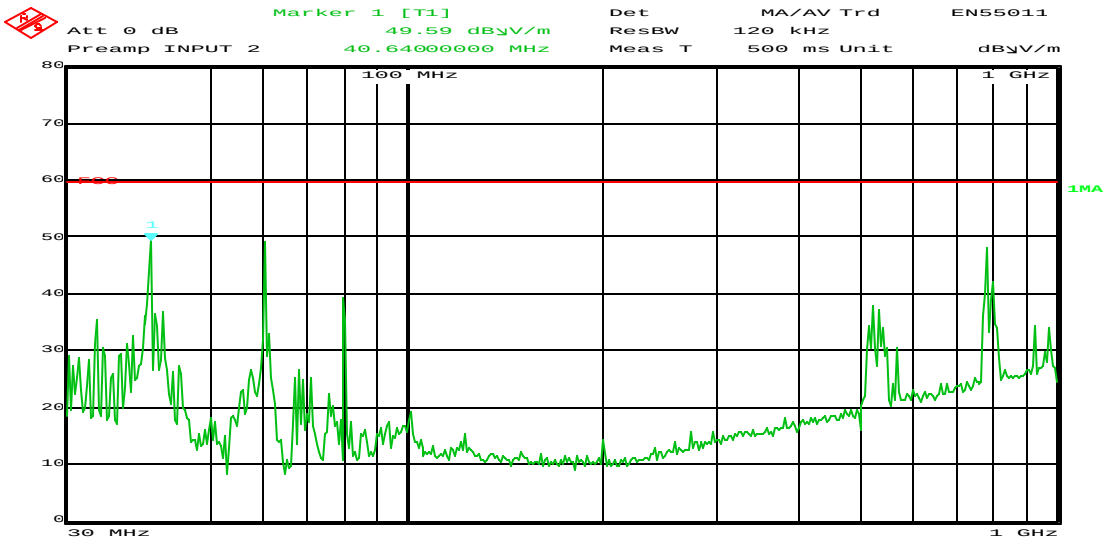
- Operating Mode: Maximum RF Power Output
- Detect Mode: Peak
- Measurement Distance: 10 meters

<Antenna Polarization: Horizontal>



Title: MC-1642GT
Comment B: ANT. HOR.
Date: 6.JAN.2003 18:44:08

<Antenna Polarization: Vertical>

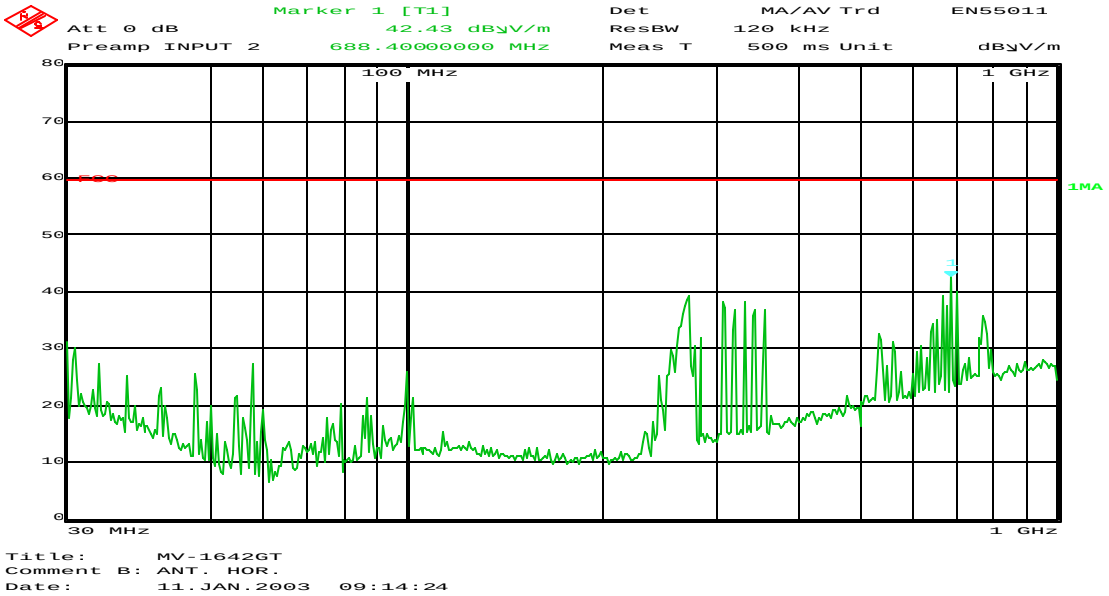


Title: MC-1642GT
Comment B: ANT. VER.
Date: 6.JAN.2003 18:41:03

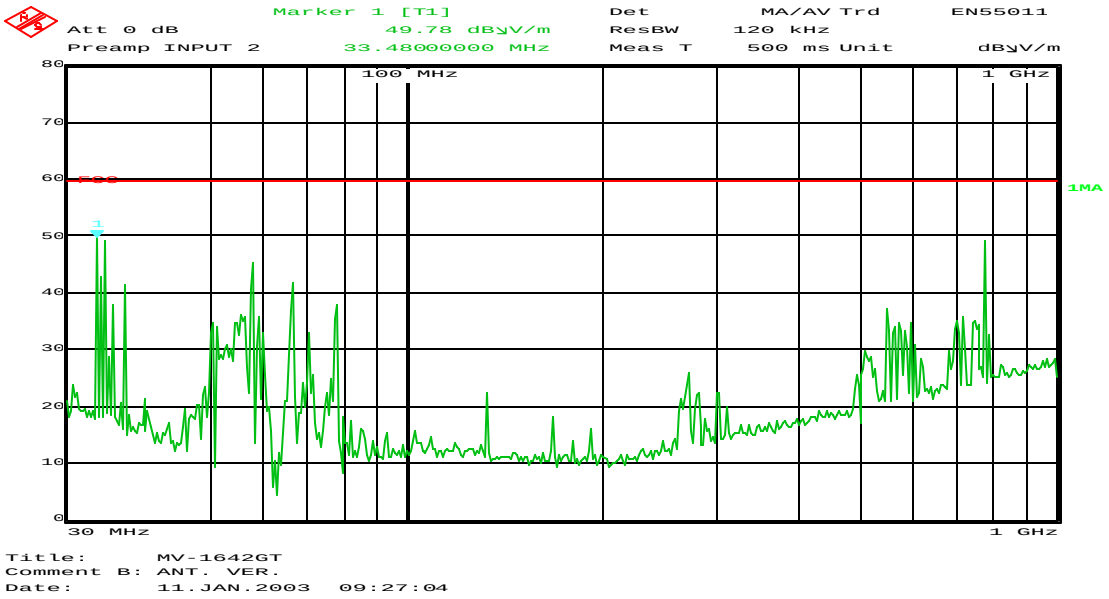
♦ 30 MHz ~ 1000 MHz (Magnetron type: 2M248J by Toshiba)

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

<Antenna Polarization: Horizontal>

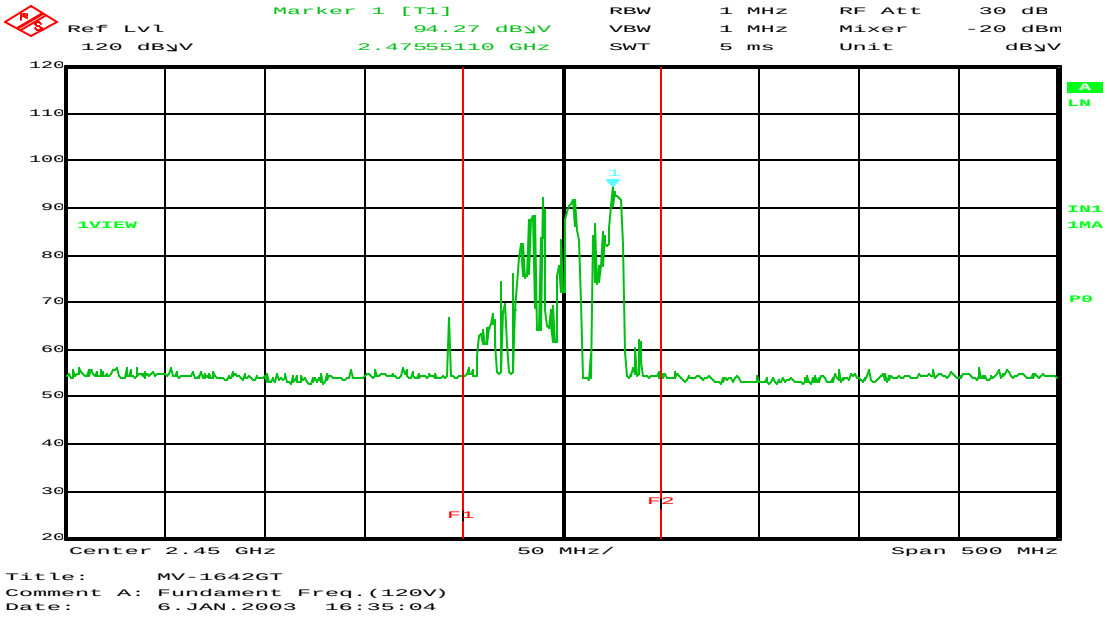


<Antenna Polarization: Vertical>

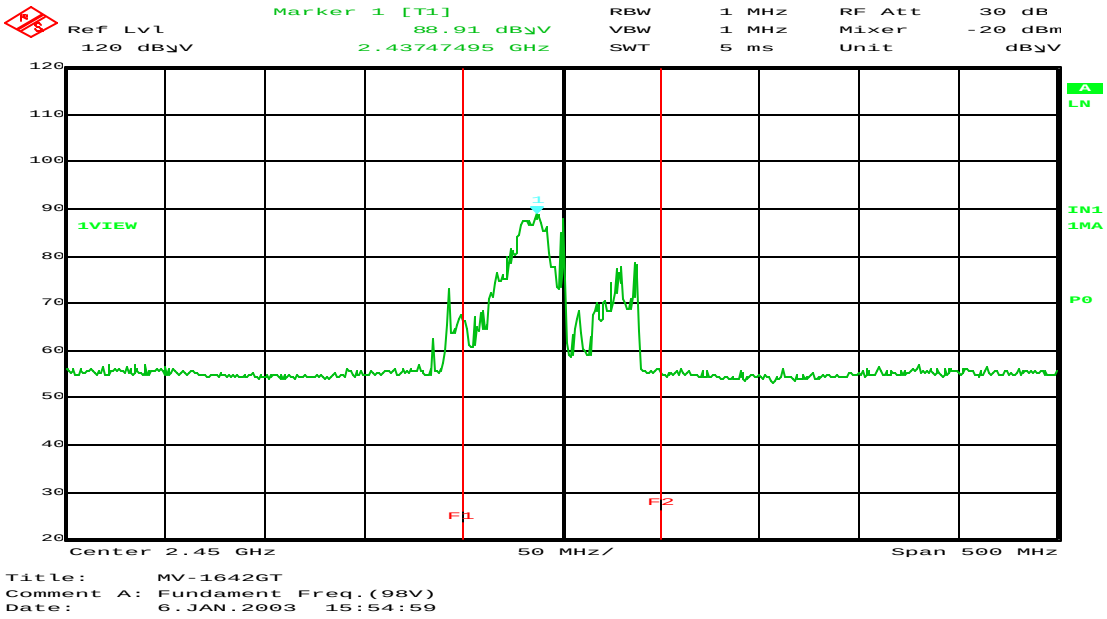


♦**Voltage Variation (Magnetron type: 2M246 by LG)**

<Maximum Frequency Observed: 2,475 MHz>

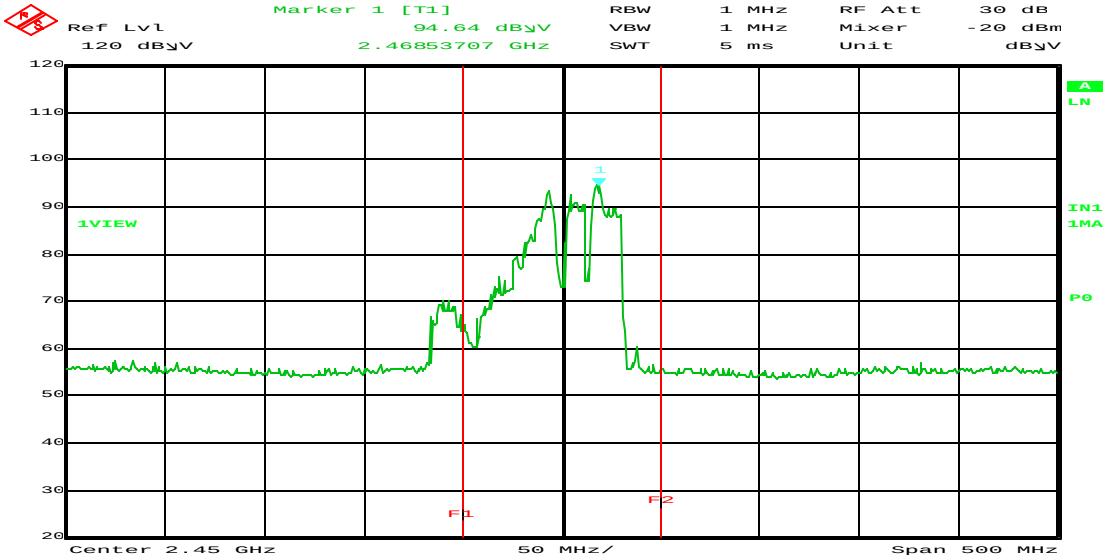


<Minimum Frequency Observed: 2,437 MHz>



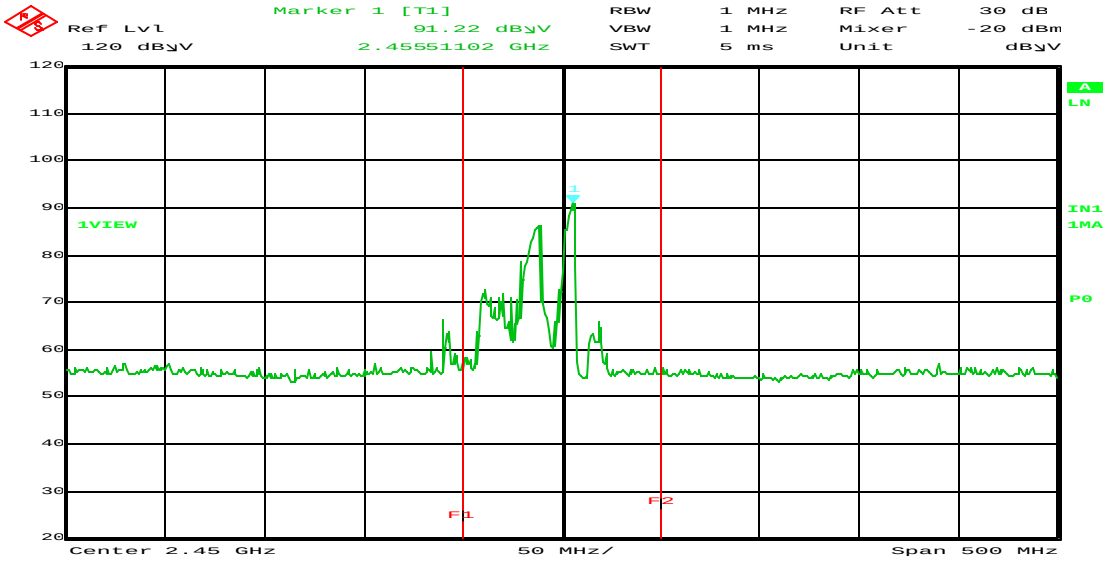
Voltage Variation (Magnetron type: 2M248J by Toshiba)

<Maximum Frequency Observed: 2,468MHz>



Title: MV-1642GT
Comment A: Fundament Freq.(120V)
Date: 11.JAN.2003 09:50:45

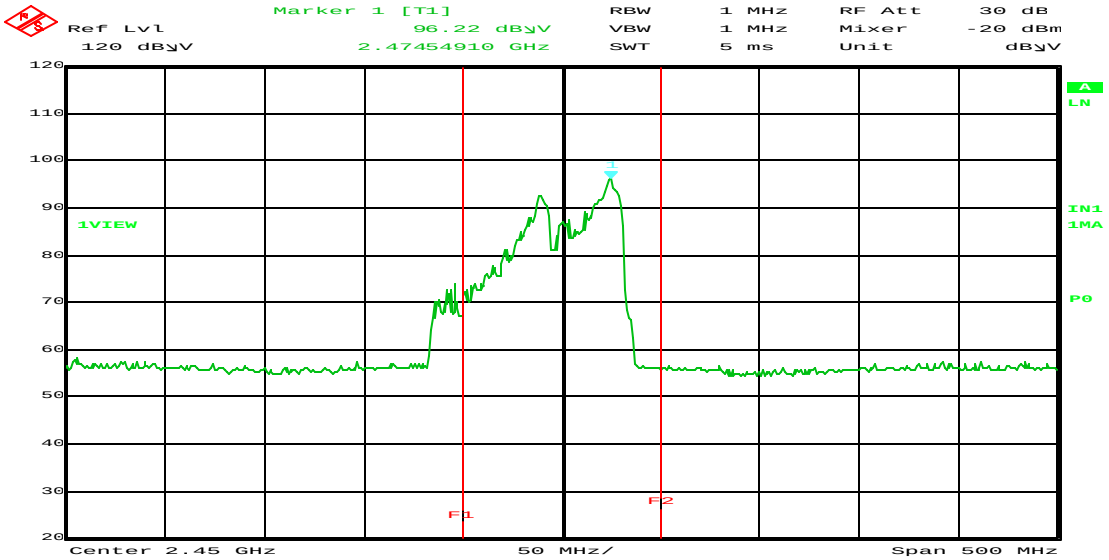
<Minimum Frequency Observed: 2,455 MHz>



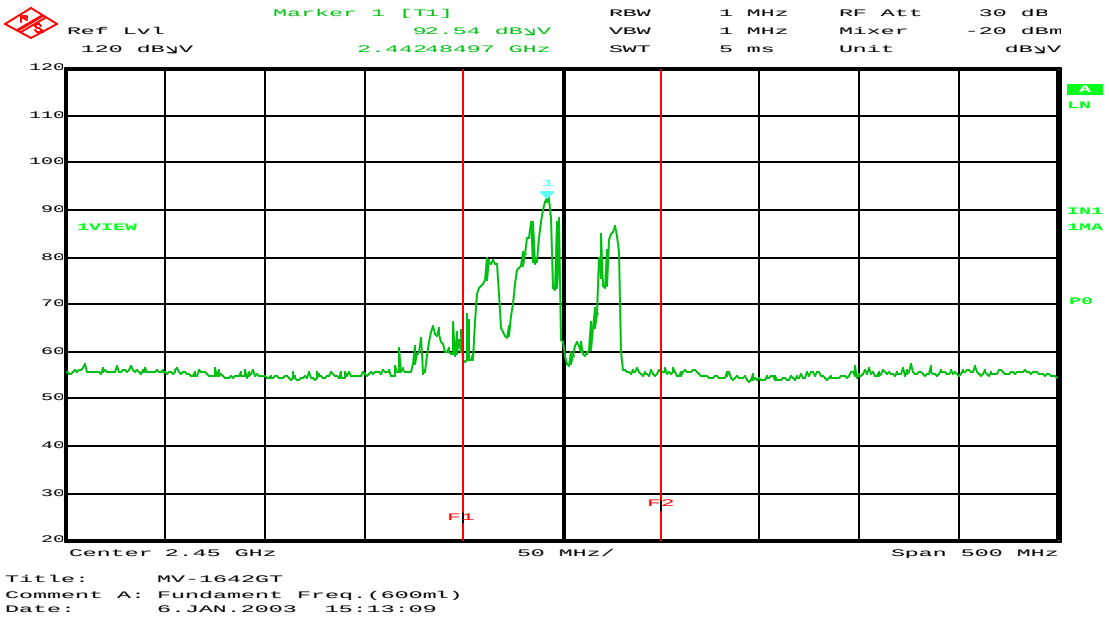
Title: MV-1642GT
Comment A: Fundament Freq.(132V)
Date: 11.JAN.2003 10:41:15

¨ **Load Variation (Magnetron type: 2M246 by LG)**

<Maximum Frequency Observed: 2,474 MHz >

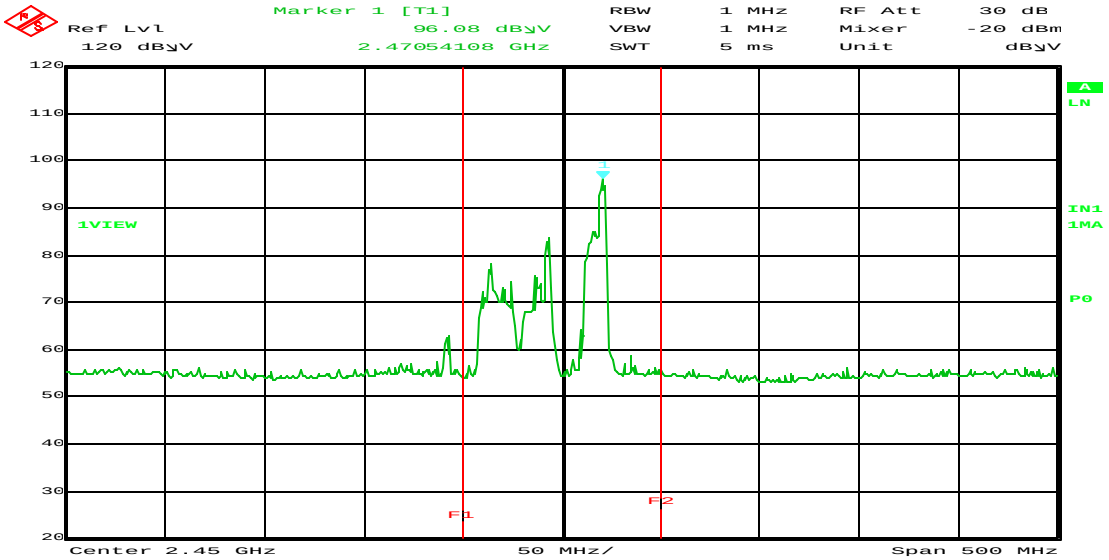


< Minimum Frequency Observed: 2,442 MHz >

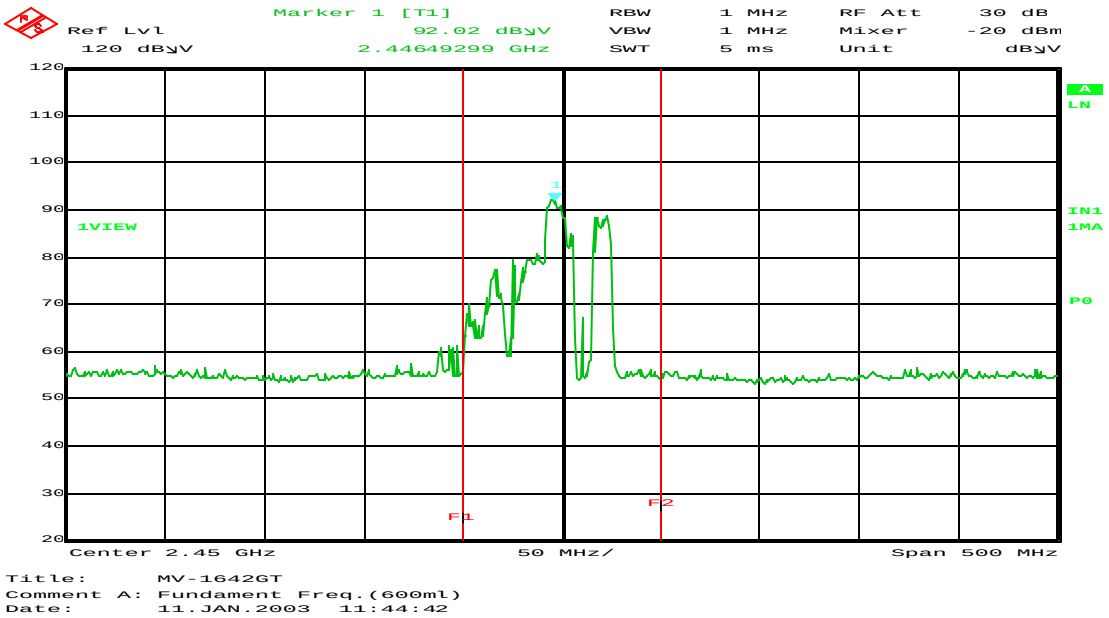


¨ **Load Variation (Magnetron type: 2M248J by Toshiba)**

<Maximum Frequency Observed: 2,470 MHz >



< Minimum Frequency Observed: 2,446 MHz >



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.

GoldStar **MICROWAVE OVEN (HOUSEHOLD)**

LISTED
57B5

MODEL NO. MV-1642GT
CATALOG NO.
INPUT 120V 13.0 A SINGLE PHASE
WITH GROUNDING 60Hz AC
OUTPUT FREQUENCY 2450MHz
COMPLIES WITH DHHS RADIATION PERFORMANCE
STANDARDS 21CFR SUBCHAPTER J.

DHHS CODE NO.: GC
FCC ID: BEJV164XK
MADE IN KOREA

Distributed by LG ELECTRONICS Inc.

MANUFACTURED:

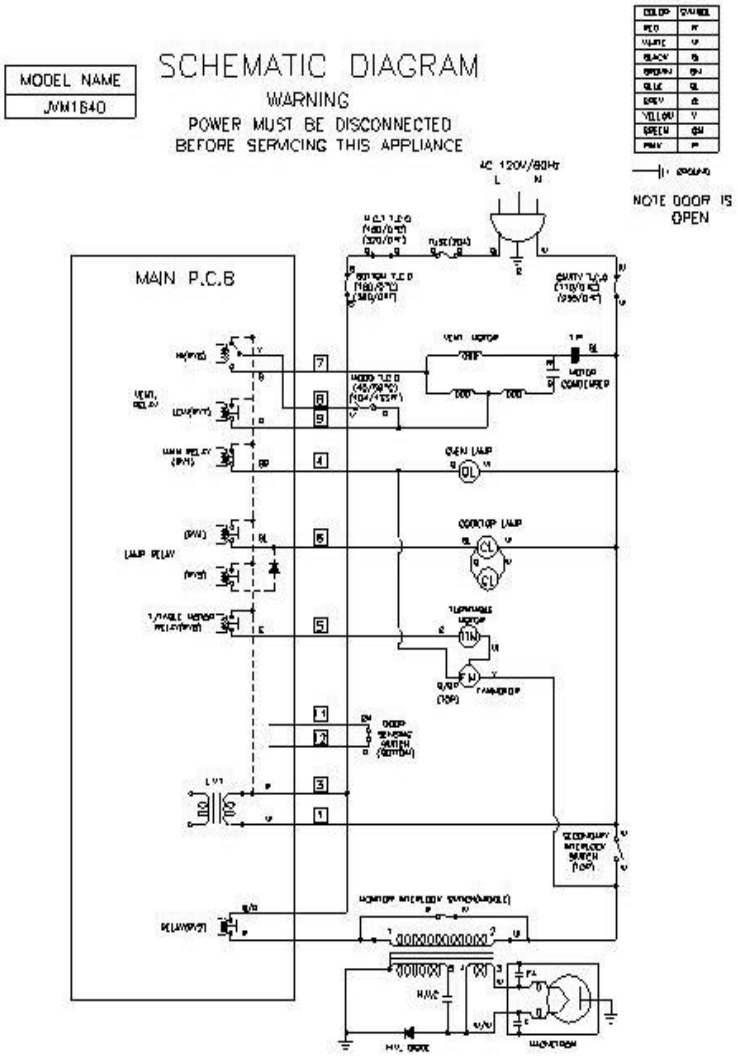
SERIAL NO:

<Fig. 1. Sample Label of Nameplate>

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

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

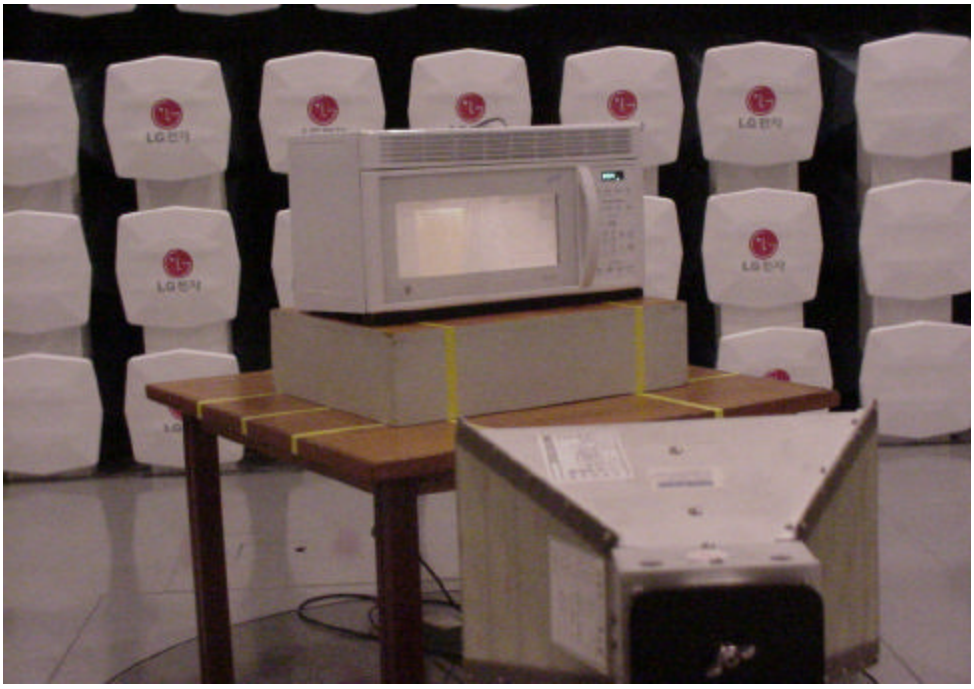
APPENDIX C. Block Diagram / Schematics

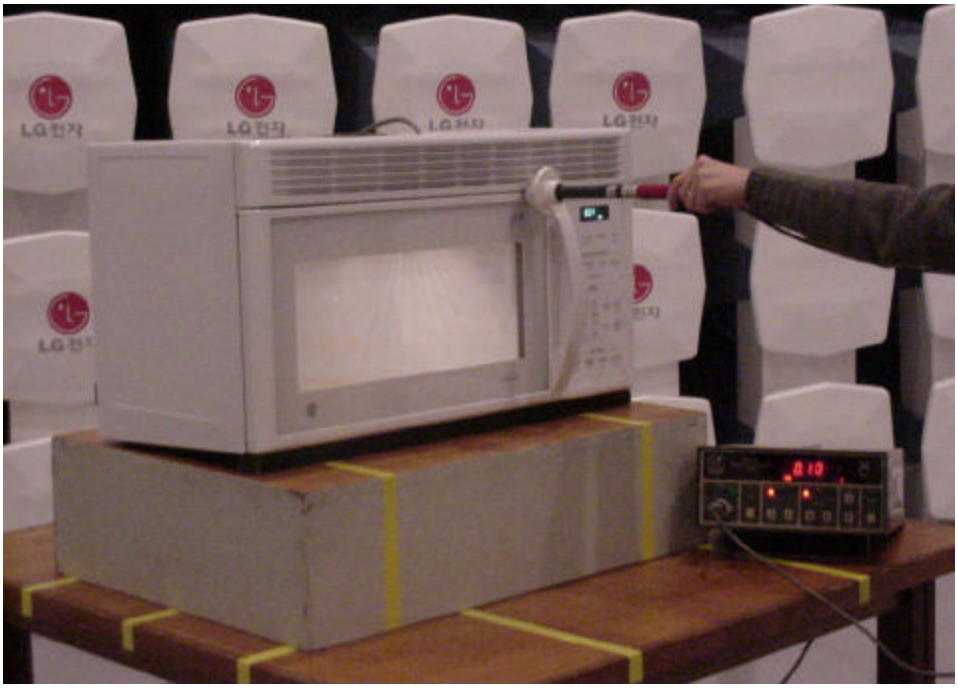


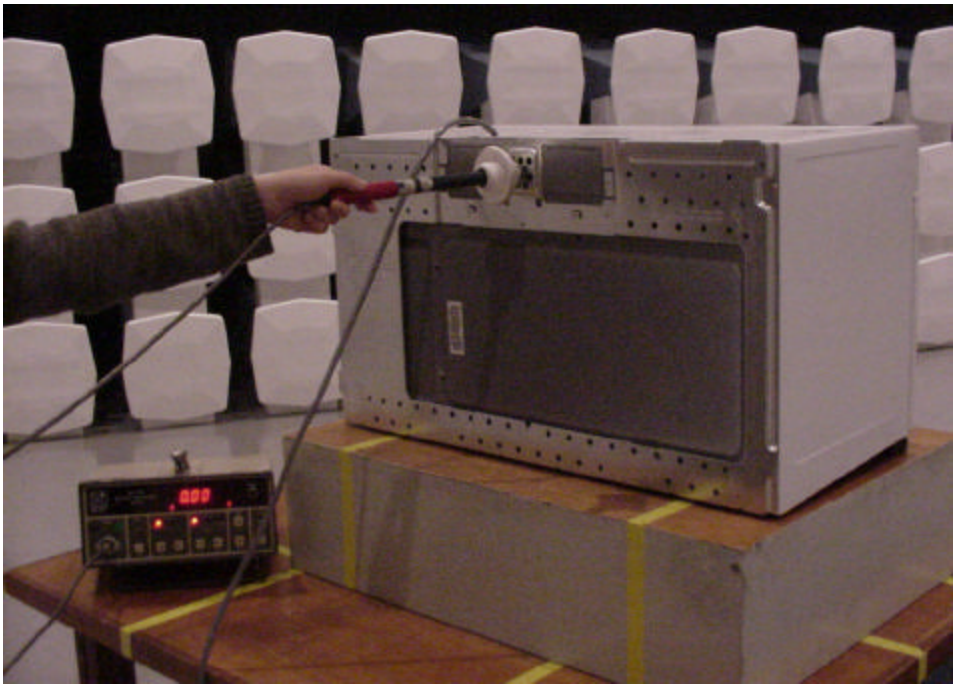
<Fig. 3. Schematic Diagram>

APPENDIX D. Test Photos

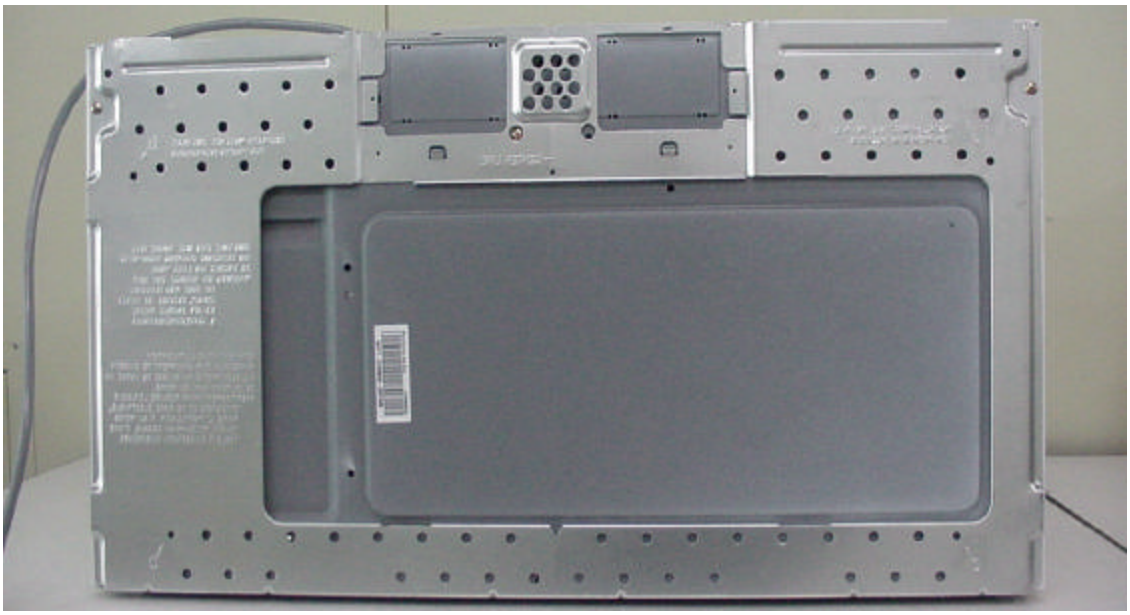
Test photos show the worst case configuration and cable placement with a minimum margin to the specifications.

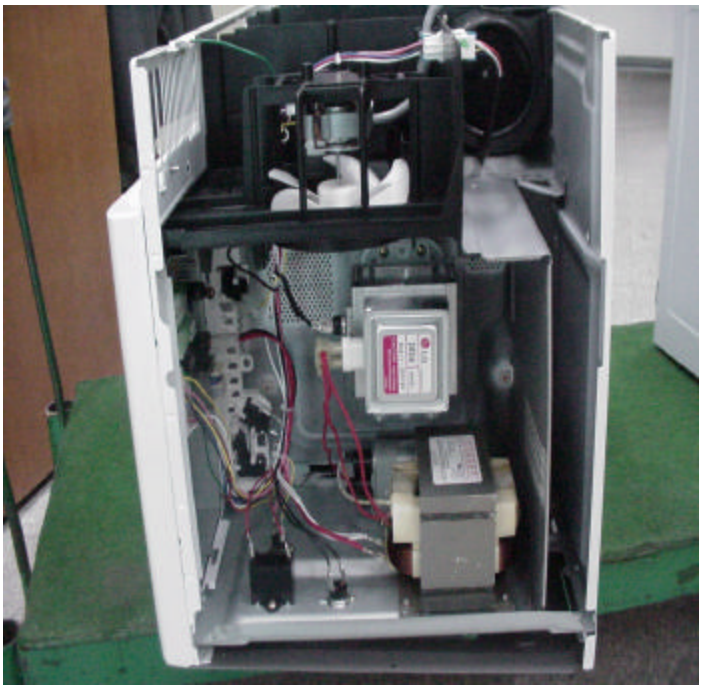


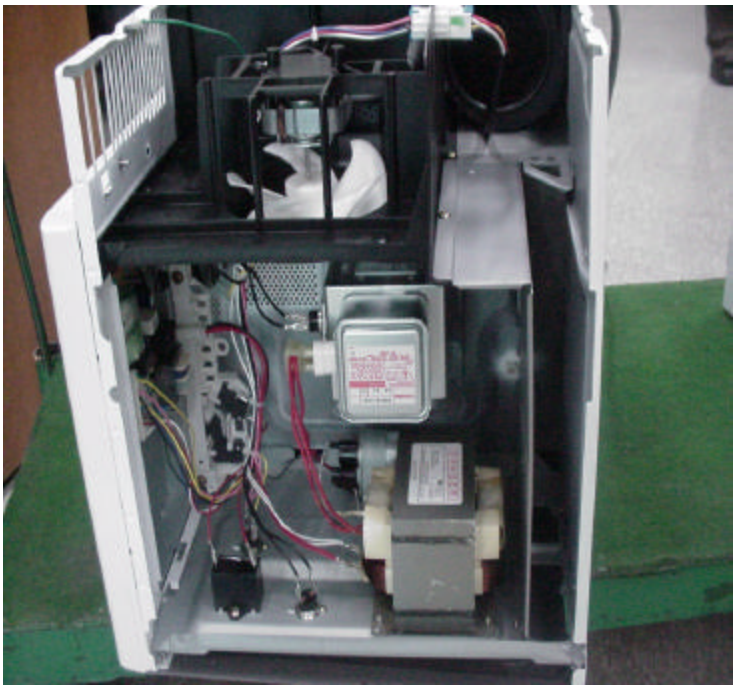


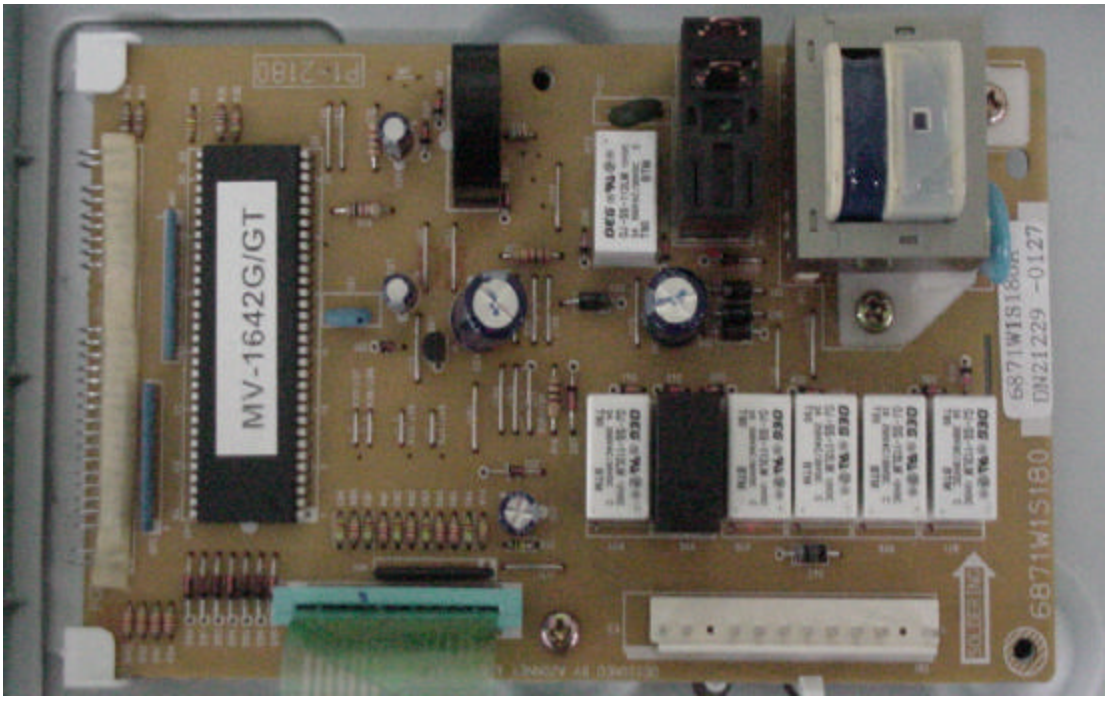


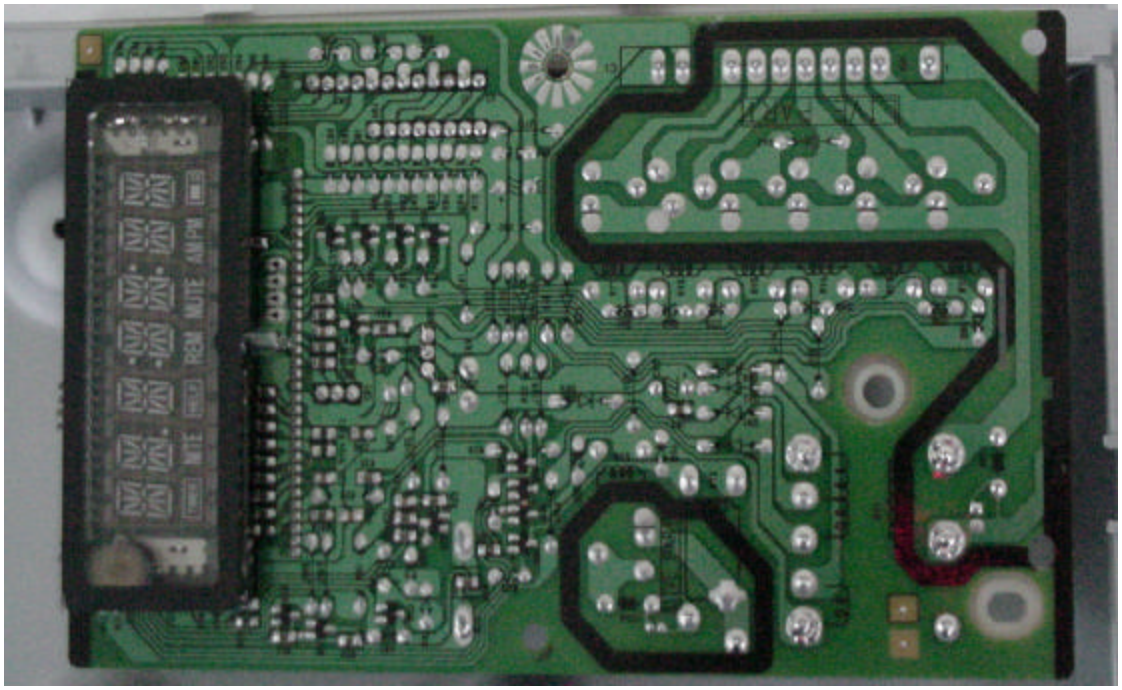
APPENDIX E. EUT Photos








MV-1642G/GT
6871W1S180
DN21229 -0127



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.