FCC PART 18 CERTIFICATION REPORT

FOR LOW POWER DEVICE

TEST REPORT No.: HM108865

Equipment Under Test [EUT]:	Microwave oven
Model Number:	63792
Applicant:	Whirlpool Microwave Products Development Ltd.
FCC ID :	PR4GH9177

CONTENT:

Appendix A

Appendix B

CONCLUSION

The submitted product was deemed to have COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15 & Part 18. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Verify by

Patrick Wong
for Chief Executive

1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate
New Territories, Hong Kong

Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Applicant Details

Applicant

Whirlpool Microwave Products Development Ltd.
16/F., Paliburg Plaza, 68 Yee Wo Street,
Causeway Bay, Hong Kong

Telephone: 86 755 3433891
Fax: 86 755 3433906

HKSTC Code Number for Applicant **WHM001**

Manufacturer

Shunde Whirlpool Electrical Appliances Co., Ltd.
No. 2 Gong Ye Road, Beijiao, Shunde, Guangdong, China

Telephone: 86 765 6656922
Fax: 86 765 6656931

1.3 Equipment Under Test [EUT]

Description of Sample

Product:	Microwave Oven
Manufacturer:	Shunde Whirlpool Electrical Appliances Co., Ltd.
Brand Name:	Kenmore
Model Number:	63792
Input Voltage:	120Va.c. 15A 1800W 60Hz
Additional Model No./Brand Name:	6379x series/Kenmore, GH9177XLQ/Whirlpool, KHMS17x series/Kitchenaid

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Whirlpool Microwave Products Development Ltd. Microwave Oven.

1.4 Date of Order

2002-09-16

1.5 Submitted Sample(s):

1 Sample per model

1.6 Test Duration

2002-11-05

1.7 Country of Origin

China

1.8 Additional Information of EUT

	Submitted	Not Available
User Manual	☒	☐
Part List	☒	☐
Circuit Diagram	☒	☐
Printed Circuit Board [PCB] Layout	☒	☐
Block diagram	☒	☐
FCC ID Label	☒	☐

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC Part 15 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Radiated Emission, 1000MHz to 18GHz	FCC Part 18 Subpart C	FCC / OST MP-5	N/A	☒	☐	☐
Input Power Measurement	FCC Part 18 Subpart C	FCC / OST MP-5	N/A	☒	☐	☐
Output Power Measurement	FCC Part 18 Subpart C	FCC / OST MP-5	N/A	☒	☐	☐
Measurement of Output Frequency	FCC Part 18 Subpart C	FCC / OST MP-5	N/A	☒	☐	☐
Output Frequency Stability	FCC Part 18 Subpart C	FCC / OST MP-5	N/A	☒	☐	☐

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

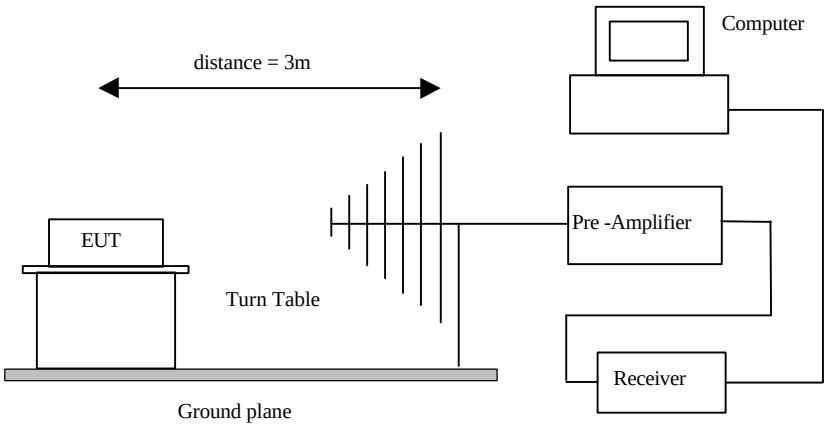
Test Requirement:	FCC Part 18 Subpart C
Test Method:	FCC / OST MP-5
Test Date:	2002-11-05
Mode of Operation:	On mode (max. power)

Test Method:

The sample was placed 0.8m above the ground plane on the OATS *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigate all operating modes, rotated about all 3 axis (X, Y & Z) to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*: OATS [Open Area Test Site] located at HKSTC with a metal ground plane on filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 90657.

Test Setup:



Radiated Emissions

Test Requirement: FCC Part 18 Subpart C
Test Method: FCC / OST MP-5
Test Date: 2002-11-05
Mode of Operation: On mode

Results:

Field Strength of Spurious Emissions Peak Value					
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Limit @3m dBµV/m	Antenna Polarity
4898.60	< 1.0	27.60	< 28.6	70.45	Vertical
7347.90	< 1.0	33.60	< 34.6	70.45	Vertical
9797.20	< 1.0	33.90	< 34.9	70.45	Vertical
12246.50	< 1.0	34.60	< 35.6	70.45	Vertical
14695.80	< 1.0	39.90	< 40.9	70.45	Vertical
17145.10	< 1.0	35.20	< 36.2	70.45	Vertical

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty = 30MHz to 300MHz ±3.7dB
300MHz to 1GHz +3.0dB / -2.7dB

Input Power Measurement

Test Requirement:	FCC Part 18 Subpart C
Test Method:	FCC / OST MP-5
Test Date:	2002-11-05
Mode of Operation:	On mode

Test Method:

Input power was measured using a Wattmeter. A 1000ml water load was located at the center of the oven. The oven was operated at full output power.

Results:

Input Measurement			Manufacturer' s Rating	
Voltage (Vac)	**Current (A)**	**Input Power (W)**	**Current (A)**	**Input Power (W)**
120	15.17	1835	15	1800

Output Power Measurement

Test Requirement:	FCC Part 18 Subpart C
Test Method:	FCC / OST MP-5
Test Date:	2002-11-05
Mode of Operation:	On mode

Test Method:

The Output power was measured by the calorimetric method; using 1000ml load and evaluate the power output from the observed temperature rise of the load over a period of time.
The test method was based on clause 8 of IEC 705, Edition 3, Household Microwave Ovens – Methods for measuring performance.

Results:

Initial Temp (°C)	Final Temp (°C)	Observed Period (s)	Output Power (W)
10	20.6	50	887.7

Remark:

$$\text{Power (W)} = \frac{4.187 \text{ (joules / cal)} \times \text{Volume (ml)} \times \Ä T}{\text{Period}}$$

$$\text{Power (W)} = \frac{4.187 \times 1000 \times 10.6}{50} = 887.7 \text{ (W)}$$

Measurement of Output Frequency

Test Requirement:	FCC Part 18 Subpart C
Test Method:	FCC / OST MP-5
Test Date:	2002-11-05
Mode of Operation:	On mode

Test Method:

The fundamental frequency was measured using a spectrum analyzer with precision frequency reference, with 1000ml load at the center of the oven.

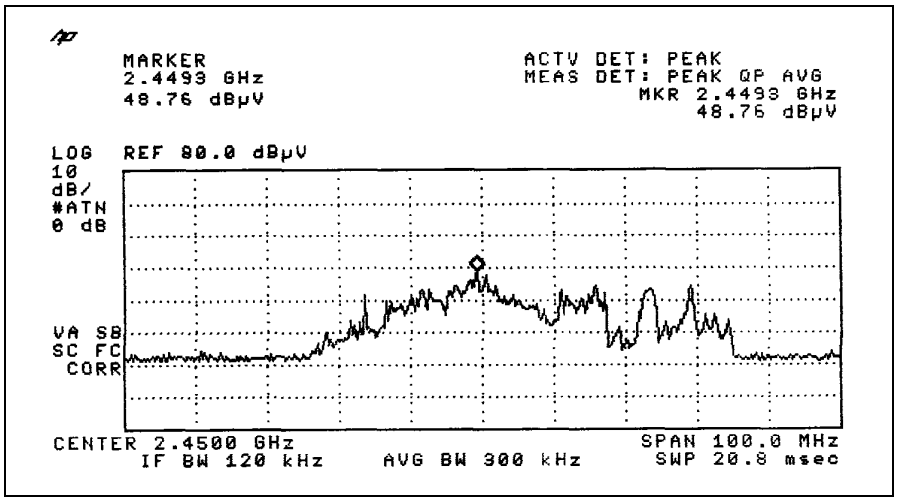
Results:

Measured Frequency (MHz)	Manufacturer' s Rated Frequency (MHz)
2449.3	2450

Remark:

See graphical (A)

Graphical (A)



Output Frequency Stability

Test Requirement: FCC Part 18 Subpart C
Test Method: FCC / OST MP-5
Test Date: 2002-11-05
Mode of Operation: On mode

Test Method:

A spectrum analyzer was used to measure the frequency variation with time, with a 1000ml load located at the center of the oven with maximum power. The test was performed until the volume was reduced by evaporation to approximately 20% of the original quantity.
During the test, the spectrum analyzer trace was put on maximum hold in order to obtain a bandwidth plot showing the sideband edges.
Measurements were performed with the antenna in both horizontal and vertical polarities.

Results:

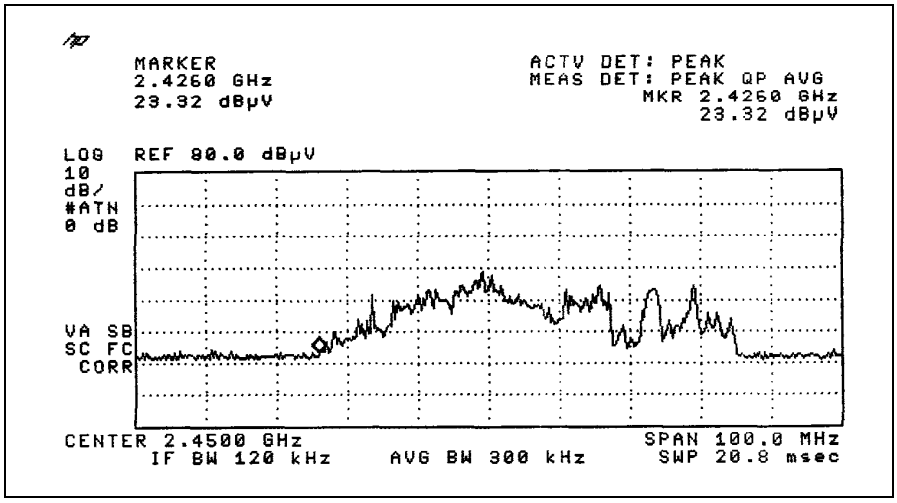
Load		**Maximum sideband edges (GHz)**		**Minimum sideband edges (GHz)**	
Initial Volume (ml)	Final Volume (ml)	Measured	Limit	Measured	Limit
1000	200	2.485	2.500	2.426	2.400

Remark:

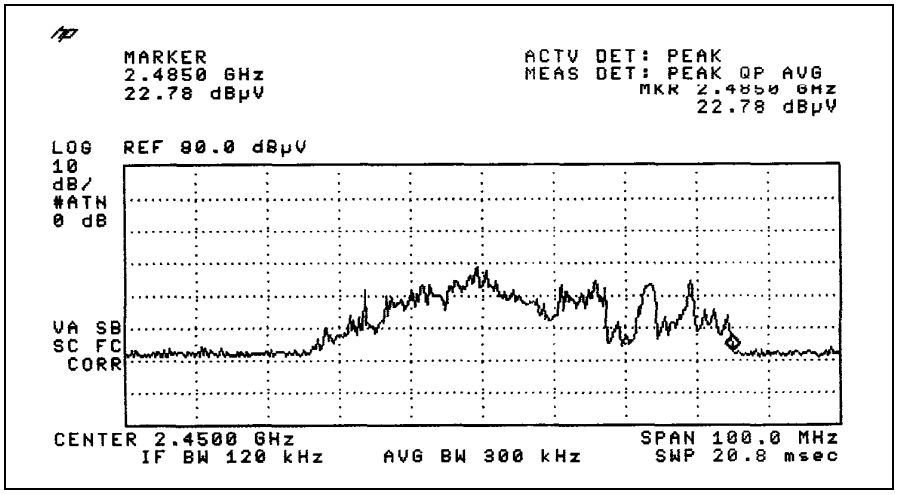
See graphical (B)

Graphical (B)

Min.



Max.



Frequency Variation With Line Voltage

Test Requirement:	FCC Part 18 Subpart C
Test Method:	FCC / OST MP-5
Test Date:	2002-11-05
Mode of Operation:	On mode

Test Method:

A spectrum analyzer was used to measure the frequency variation for line voltage variation from 80% to 125% of normal voltage, with a 1000ml load located at the center of the oven with maximum power. During the test, the spectrum analyzer trace was put on, maximum hold in order to obtain a bandwidth plot showing the sideband edges.
Measurements were performed with the antenna in both horizontal and vertical polarities.

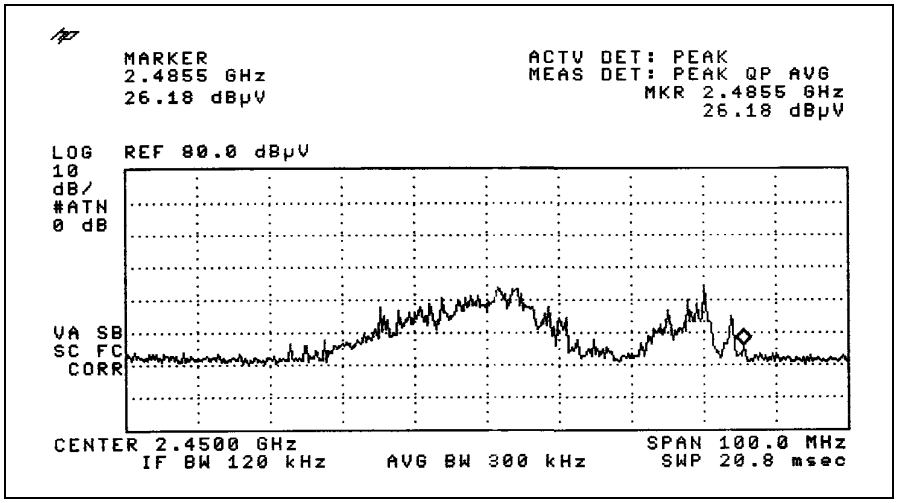
Results:

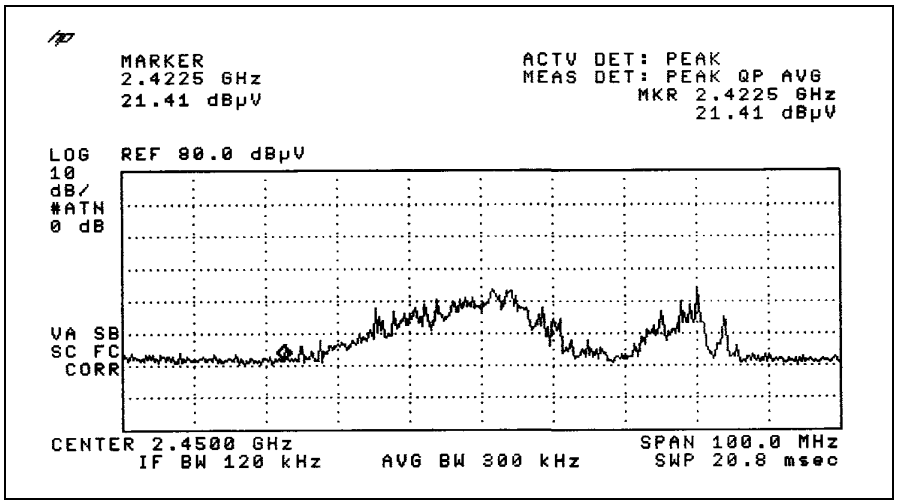
Voltage	Maximum sideband edges		Voltage	Minimum sideband edges	
	Measured	Limit		Measured	Limit
(Vac)	(GHz)	(GHz)	(Vac)	(GHz)	(GHz)
150	2.4855	2.500	150	2.4225	2.400

Remark:

See graphical (C)

Graphical (C)


MARKER
2.4855 GHz
26.18 dBµV
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4855 GHz
26.18 dBµV
LOG
10
dB/
#ATN
0 dB
REF 80.0 dBµV
VA SB
SC FC
CORR
CENTER 2.4500 GHz
IF BW 120 kHz
AVG BW 300 kHz
SPAN 100.0 MHz
SWP 20.8 msec


MARKER
2.4225 GHz
21.41 dBµV
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4225 GHz
21.41 dBµV
LOG
10
dB/
#ATN
0 dB
REF 80.0 dBµV
VA SB
SC FC
CORR
CENTER 2.4500 GHz
IF BW 120 kHz
AVG BW 300 kHz
SPAN 100.0 MHz
SWP 20.8 msec

Frequency Variation With Line Voltage

Test Requirement:	FCC Part 18 Subpart C
Test Method:	FCC / OST MP-5
Test Date:	2002-11-05
Mode of Operation:	On mode

Test Method:

A spectrum analyzer was used to measure the frequency variation for line voltage variation from 80% to 125% of normal voltage, with a 1000ml load located at the center of the oven with maximum power. During the test, the spectrum analyzer trace was put on, maximum hold in order to obtain a bandwidth plot showing the sideband edges.
Measurements were performed with the antenna in both horizontal and vertical polarities.

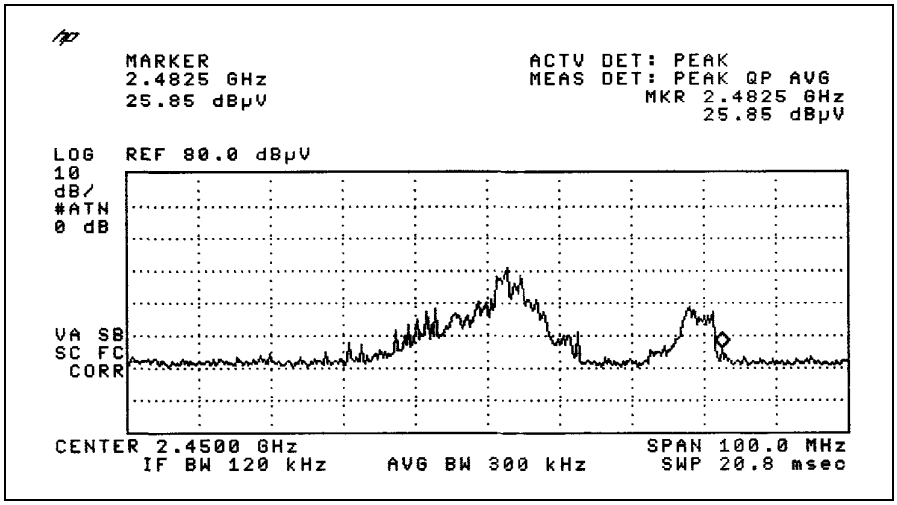
Results:

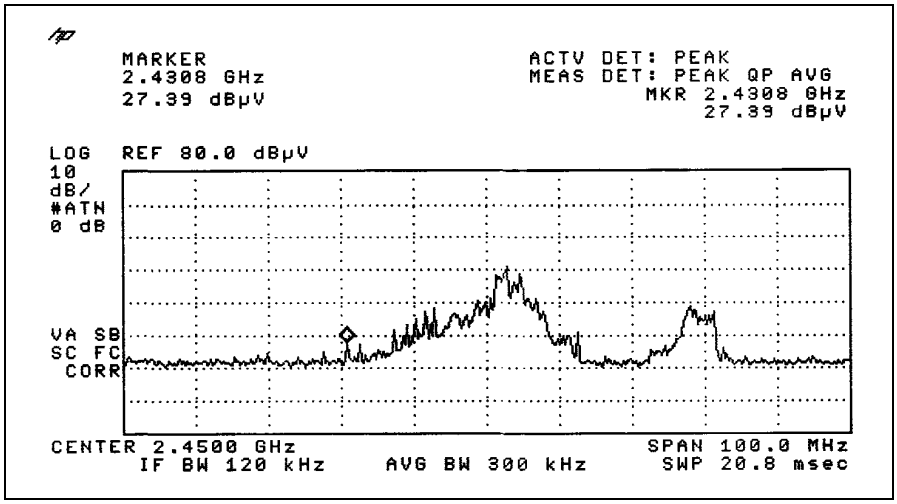
Voltage	Maximum sideband edges		Voltage	Minimum sideband edges	
	Measured	Limit		Measured	Limit
(Vac)	(GHz)	(GHz)	(Vac)	(GHz)	(GHz)
96	2.4825	2.500	96	2.4308	2.400

Remark:

See graphical (D)

Graphical (D)


MARKER
2.4825 GHz
25.85 dBµV
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4825 GHz
25.85 dBµV
LOG
10
dB/
#ATN
0 dB
REF 80.0 dBµV
VA SB
SC FC
CORR
CENTER 2.4500 GHz
IF BW 120 kHz
AVG BW 300 kHz
SPAN 100.0 MHz
SWP 20.8 msec


MARKER
2.4308 GHz
27.39 dBµV
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4308 GHz
27.39 dBµV
LOG
10
dB/
#ATN
0 dB
REF 80.0 dBµV
VA SB
SC FC
CORR
CENTER 2.4500 GHz
IF BW 120 kHz
AVG BW 300 kHz
SPAN 100.0 MHz
SWP 20.8 msec

Appendix A

Test Equipment Audit

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL.
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192	07/09/01
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514	07/09/01
EM009	QUASI PEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702	07/09/01
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410	07/09/01
EM011	ATTENNUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595	07/09/01
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262	07/09/01
EM013	CONTROLLER (COMPUTER), COLOR MONITOR, KEYBOARD & MOUSE FLOPPY DRIVE	HEWLETT PACKARD HEWLETT PACKARD HEWLETT PACKARD	HP9000 HP A1097C HP9133L	6226A60314 3151J39517 2623A02468	CM
EM020	HORN ANTENNA	EMCO	3115	4032	19/07/00
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	04/08/00
EM072	SIGNAL GENERATOR	HEWLETT PACKARD	8640B	1948A11892	N/A
EM083	HKSTC OPEN AREA TEST SITE	HKSTC	N/A	N/A	14/02/02
EM131	PORTABLE SPECTRUM ANALYSER	HEWLETT PACKARD	8595EM	3710A00155	18/12/01
EM145	EMI TEST RECEIVER	R & S	ESCS 30	830245/021	22/07/02
EM194	BICONILOG ANTENNA	EMCO	3142B	1795	14/05/02
EM196	MULTI-DEVICE CONTROLLER	EMCO	2090	1662	N/A
EM195	ANTENNA POSITIONING MAST	EMCO	2075	2368	N/A

Conducted Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM078	VARIAC	SHANGHAI VOLTAGE	TDGC-3/0.5	N/A	CM
EM081	SMALL SCREENED ROOM	MIKO INST HK	N/A	N/A	04/10/01
EM002	LISN	EMCO	3825-2	9005-1657	22/08/01
EM119	LISN	R & S	ESH3-Z5	0831.5518.52	31/08/00
EM127	ISOLATION TRANSFORMER 220 TO 300	WING SUN	N/A	N/A	CM
EM142	PULES LIMITER	R & S	ESH3Z2	357.8810.52	04/07/01
EM181	EMI TEST RECEIVER	R & S	ESIB7	100072	28/11/01
EM154	SHIELDING ROOM	SIEMENA MATSUSHITA COMPONENTS	N/A	803-740-057-99A	02/01/02

Remarks:

CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined

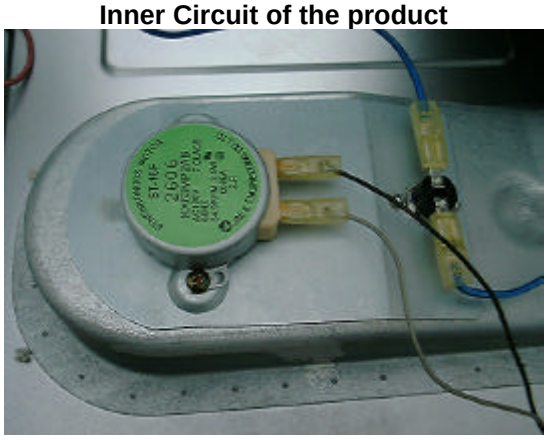
Appendix B

Photographs of EUT

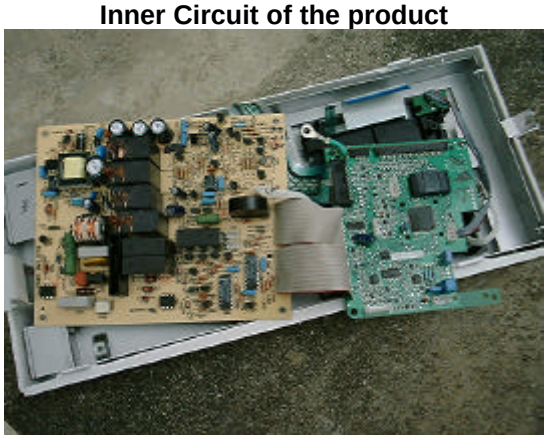
Front View of the product

Rear View of the product

Inner Circuit of the product

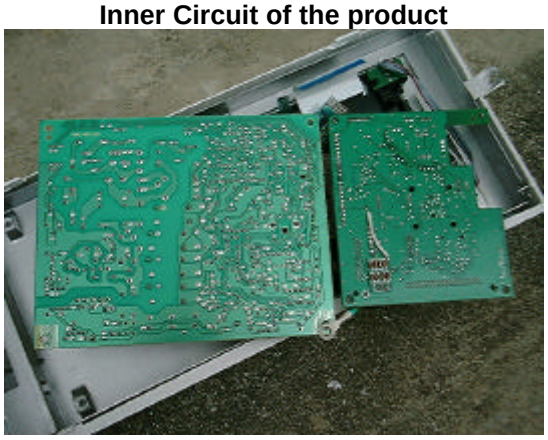


Inner Circuit of the product

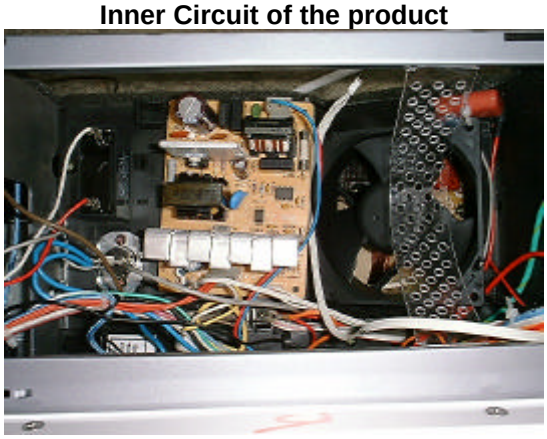


Photographs of EUT

Inner Circuit of the product



Inner Circuit of the product



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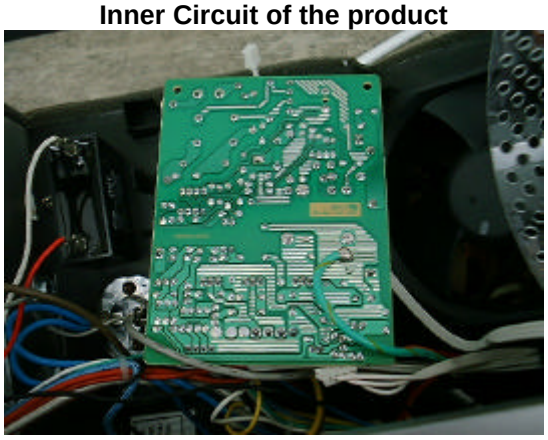
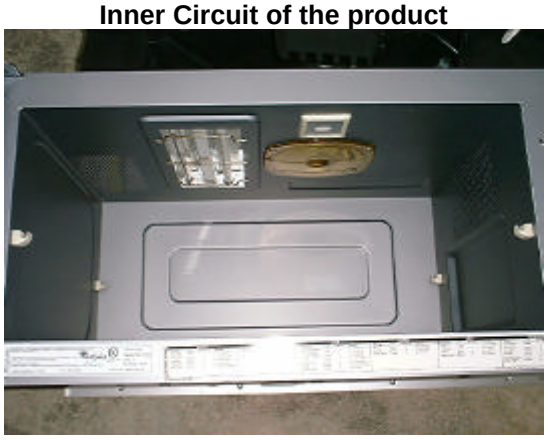


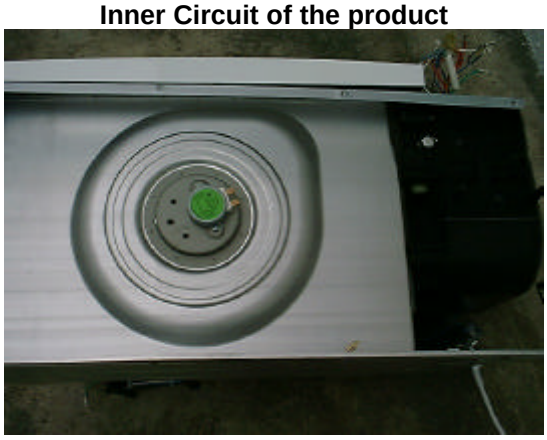
Inner Circuit of the product

Photographs of EUT

Inner Circuit of the product

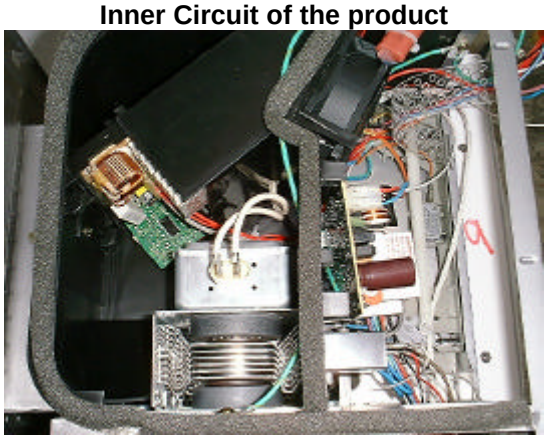


Inner Circuit of the product



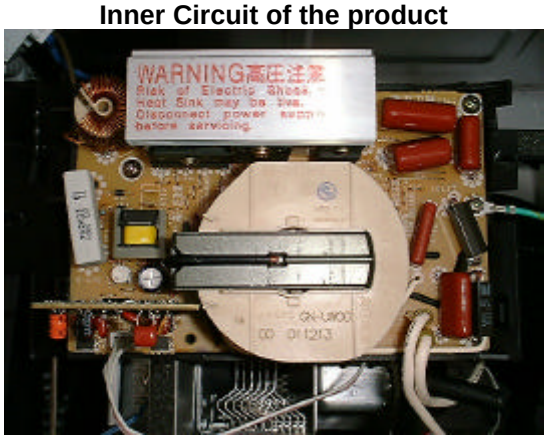
Inner Circuit of the product

Inner Circuit of the product

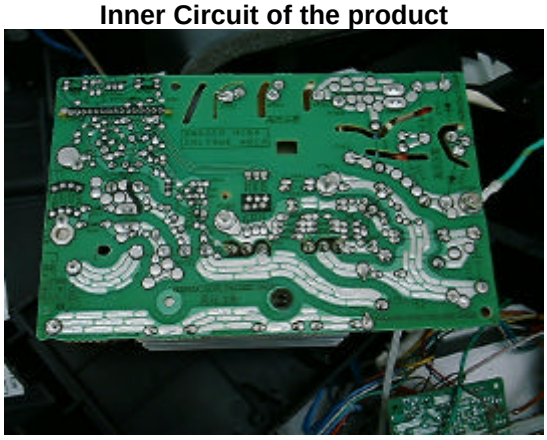


Photographs of EUT

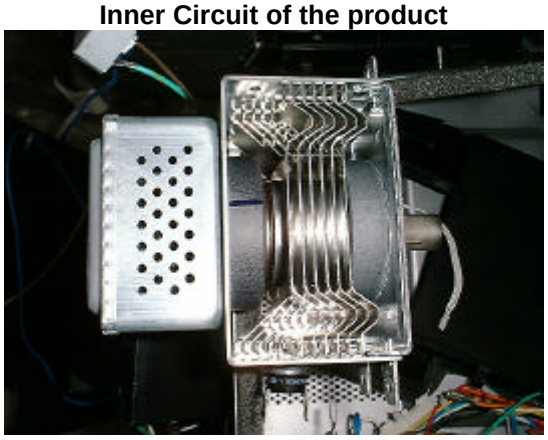
Inner Circuit of the product



Inner Circuit of the product

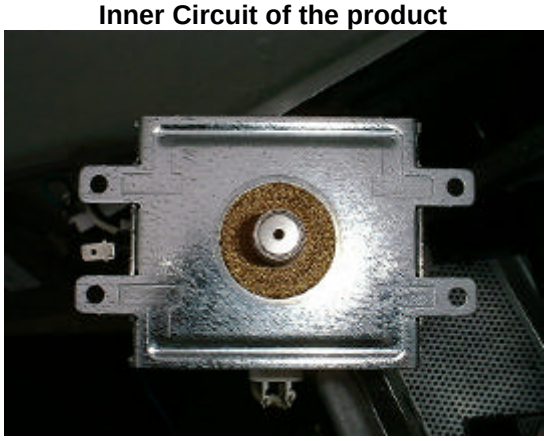


Inner Circuit of the product



Inner Circuit of the product

Inner Circuit of the product



Measurement of Radiated Emission Test Set Up

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