

# EMC TEST REPORT

For

Microwave Oven

Model Number: WD1000DI-C30C (A), WP1000D-C30(B)

FCC ID:NRTSJENSMWOC30AB

Report Number : WT058000946

Test Laboratory : Shenzhen Academy of Metrology and  
Quality Inspection EMC Laboratory  
Guangdong EMC Compliance Test Center

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## TEST REPORT DECLARATION

Applicant : SHENZHEN JENS ELECTRONIC CO., LTD  
Address : 71# Building changxing Industrial Zone Gongming Town, Baoan, Shenzhen, China.  
Manufacturer : SHENZHEN JENS ELECTRONIC CO., LTD  
Address : 71# Building changxing Industrial Zone Gongming Town, Baoan, Shenzhen, China.  
EUT Description : Microwave oven  
Model Number : WD1000DI-C30C (A), WP1000D-C30(B)

Test Standards:

### FCC Part 18

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Tested by:   
\_\_\_\_\_  
(Louis Lin) Date: 2005-12-6

Checked by:   
\_\_\_\_\_  
(Dewelly Yang) Date: 2005-12-6

Approved by:   
\_\_\_\_\_  
(Peter Lin) Date: 2005-12-6

## 1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
Conducted Disturbance	Pass
Radiated disturbance	Pass

## 2. GENERAL INFORMATION

### 2.1. Report information

2.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

2.1.2. The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

2.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

### 2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at Bldg. of Metrology & Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, Guangdong, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Committee for Laboratories (**CNAL**) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (**FCC**), and the registration number are **97379**(open area test site) and **274801**(semi anechoic chamber).

The Laboratory is listed in Voluntary Control Council for Interference by Information Technology Equipment (**VCCI**), and the registration number are **R-1974**(open area test site) , **R-1966**(semi anechoic chamber),**C-2117**(mains ports conducted interference measurement) and **T-180**(telecommunication ports conducted interference measurement).

The Laboratory is registered to perform emission tests with Industry Canada (**IC**), and the registration number is **IC4174**.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is E2024086Z02.

### 2.3. Measurement Uncertainty

Available upon request.

### 3. PRODUCT DESCRIPTION

#### 3.1. EUT Description

Description : Microwave oven  
 Applicant : WD1000DI-C30C (A), WP1000D-C30(B)  
 Model Number : SHENZHEN JENS ELECTRONIC CO., LTD  
 Input : AC120V/60Hz  
 Rated Microwave Power : 900W  
 Magnetron : TOSHIBA 2M248K(SJ)

Remark: The sameness and differences between WD1000DI-C30C(A) WP1000D-C30(B) are as follows:

1, Above two models belong to the same series products, most relevant parameter, such as microwave input power, output power, cavity capacity, oven door's appearance, interlock switch, and all safety component, are exactly the same.

2, Above two products are all digital controlled.

3, The difference between both models:

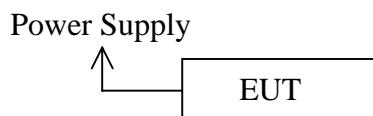
A, Besides microwave function, WD1000DI-C30C(A) has extra function as grill and convection compare with WP1000D-C30(B)

B, Digital control board are the same except the button's shape (five buttons of C30C(A) is square shape, while of C30(B) is round shape)

C, The difference between two models' PCB board: The schematic diagrams of the two models are the same. On the PCB of WP1000D-C30(B), components for grill and convection function are omitted.

The EMC test is performed on model WD1000DI-C30C(A) only.

#### 3.2. Block Diagram of EUT Configuration



#### 3.3. Operating Condition of EUT

Test mode 1: 100P (Full power microwave output)

### **3.4. Support Equipment**

N/A

### **3.5. Test Conditions**

Temperature: 23-24°C

Relative Humidity: 56-57%

### **3.6. Modifications**

No modification was made.

## 4. TEST EQUIPMENT USED

### 4.1. Test Equipment Used to Measure Conducted Disturbance

Table 2 Conducted Disturbance Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB3319	EMI Test Receiver	Rohde & Schwarz	ESCS30	Jan.30, 2005	1 Year
SB4357	AMN	Rohde & Schwarz	ESH2-Z5	Jan.30, 2005	1 Year

### 4.2. Test Equipment Used to Measure Radiated Disturbance

Table 3 Radiated Disturbance Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB3436	EMI Test Receiver	Rohde & Schwarz	ESI26	Jan.30, 2005	1 Year
SB3440	Bilog Antenna	Chase	CBL6112B	Jan.30, 2005	1 Year
SB3435	Horn Antenna	Rohde & Schwarz	HF906	Jan 30, 2005	1 Year

## 5. CONDUCTED DISTURBANCE TEST

### 5.1. Test Standard and Limit

#### 5.1.1. Test Standard

FCC Part 18

#### 5.1.2. Test Limit

Table 4 Conducted Disturbance Test Limit (Part 18 consumer device)

Frequency	Limit (dB $\mu$ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

\* Decreasing linearly with logarithm of the frequency

### 5.2. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions form both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

### 5.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

### 5.4. Test Data

The emissions don't show in below are too low against the limits, the test curves are shown in the APPENDIX I

Table 5 Conducted Disturbance Test Data

Model No.: WD1000DI-C30C(A)													
Test Mode: 1													
Frequency (MHz)	Line				Neutral				Frequency (MHz)	Quasi-Peak		Average	
	Reading (dB $\mu$ V)	Limit (dB $\mu$ V)		Reading (dB $\mu$ V)	Limit (dB $\mu$ V)	Reading (dB $\mu$ V)	Limit (dB $\mu$ V)						
0.150	41.5	66	14.6	56	0.150	47.5	66	21.1	56				
0.178	36.4	64.6	12.2	54.6	0.162	44.6	65.4	19.0	55.4				
0.230	28.9	62.5	8.3	52.5	0.178	35.5	64.6	15.7	54.6				
0.254	30.0	61.6	8.5	51.6	0.198	30.6	63.7	9.3	53.7				
0.410	37.7	57.7	11.2	47.7	0.414	37.6	57.6	13.1	47.6				
0.434	39.7	57.2	16.5	47.2	0.446	41.2	57.0	15.8	47.0				

## 6. RF POWER OUTPUT MEASUREMENT AND RESULT

The Calorimetric Method was used to determine maximum output power. A 1000 ml water load was placed in the center of the oven. A thermometer was used to measure temperature rise.

$$Power(W) = \frac{(4.2 \text{ Joules/Cal}) * (VolumeInml) * (TemperatureRise)}{TimeinSeconds}$$

Magnetron type: TOSHIBA 2M248K(SJ)

Quantity of Water(ml)	Starting Temperature(°C)	Final Temperature((°C))	Elapsed Time(Second)
1000	34.9	45.3	60

$$Power(W) = \frac{(4.2) * (1000) * (10.4)}{60}$$

$$Power(W) = 728$$

## 7. RADIATED DISTURBANCE TEST

### 7.1. Test Standard and Limit

#### 7.1.1. Test Standard

FCC Part 18

#### 7.1.2. Test Limit

Table 6 Radiated Disturbance Test Limit

Operating Frequency	RF Power generated by equipment(watts)	Field strength limit ( $\mu$ V/m)	Distance (m)
Any ISM Frequency	Below 500	25	300
	500 or more	$25 \times \text{SQRT}(\text{power}/500)$	300

\*For the EUT of this test report, the measured RF power is 728W, and at test distance of 3 meters, the test limit is provided as  $69.6 \text{ dB}\mu\text{V/m}$  according to the table above.

### 7.2. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set **3 meters** away from the receiving antenna, which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

### 7.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

### 7.4. Test Data

Emissions don't show below are too low against the limits, the test curves are shown in the APPENDIX I

Table 7 Radiated Disturbance Test Data

Model No.: WD1000DI-C30C(A)

Test Mode: 1

Frequency MHz	Emission Level dB( $\mu$ V/m)	Polarization	Limits dB ( $\mu$ V/m)
4221.300	32.5	Horizontal	69.6
6931.400	40.0	Horizontal	69.6
17351.100	49.5	Horizontal	69.6
14700.400	49.5	Horizontal	69.6
8644.330	39.2	Vertical	69.6
14867.230	48.2	Vertical	69.6
17286.300	49.4	Vertical	69.6

Remark: For test above 1GHz, Average detector with 1MHz RBW is used.

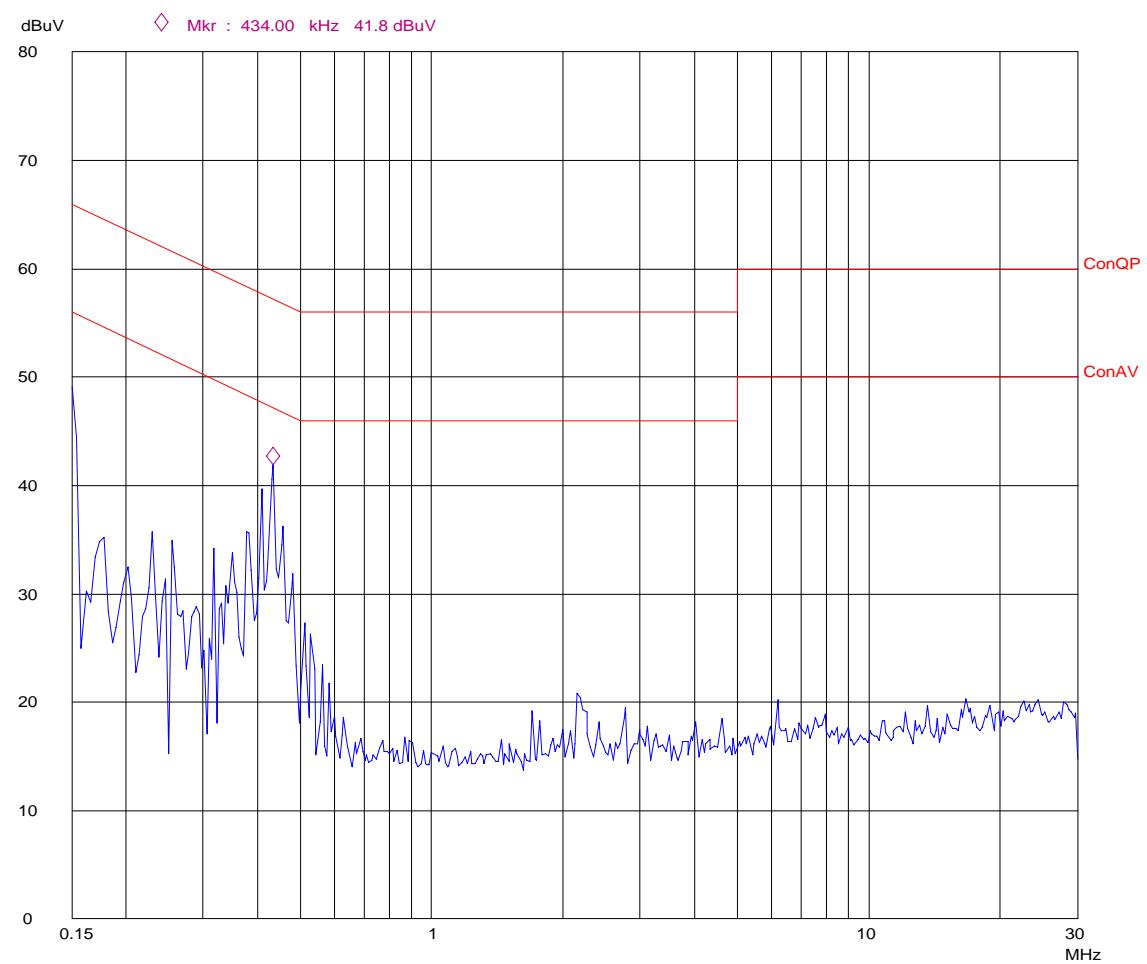
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## **APPENDIX I TEST CURVES**

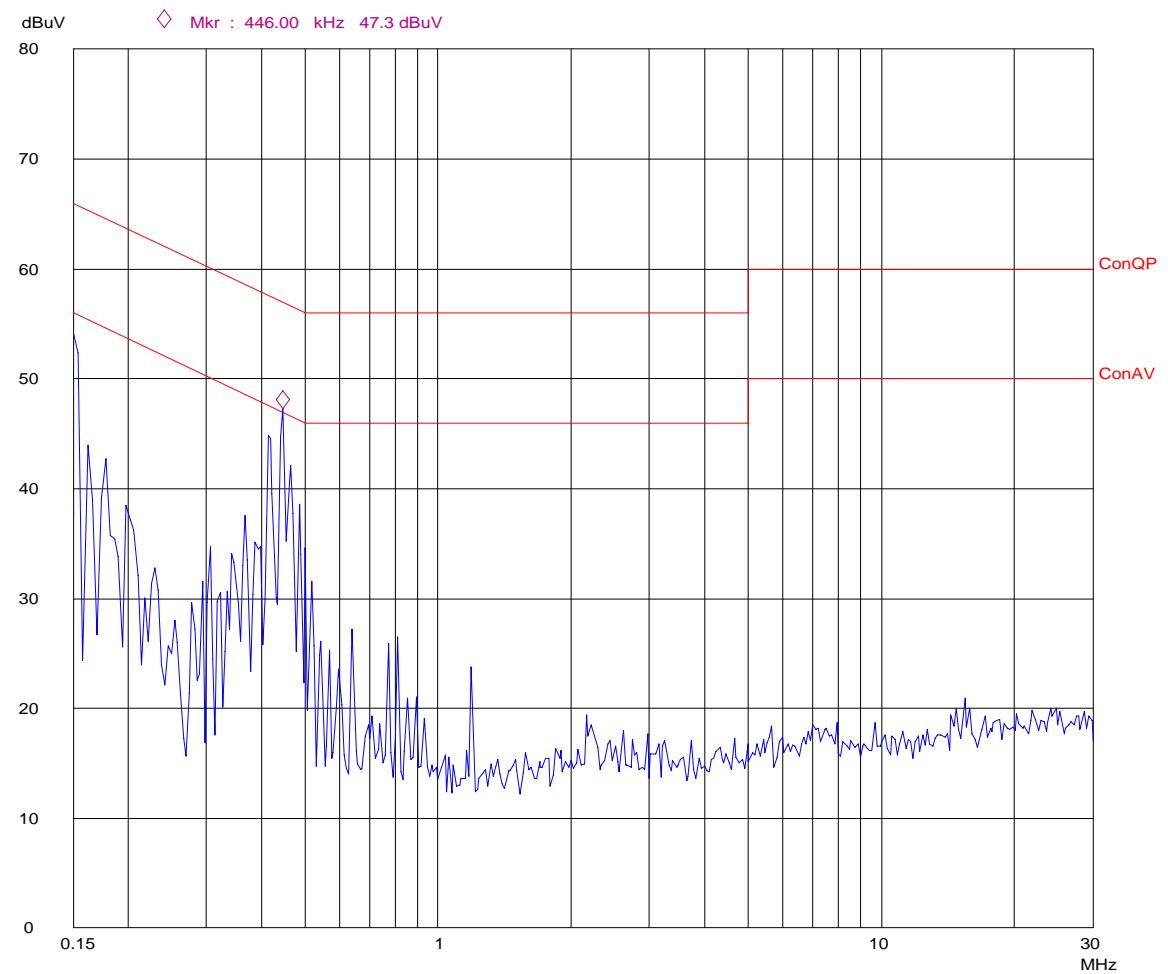
## Conducted Disturbance

EUT: M/N:WD1000DI-C30C(A)  
Op Cond: 100 P  
Test Spec: L  
Comment: AC 120V/60Hz



## Conducted Disturbance

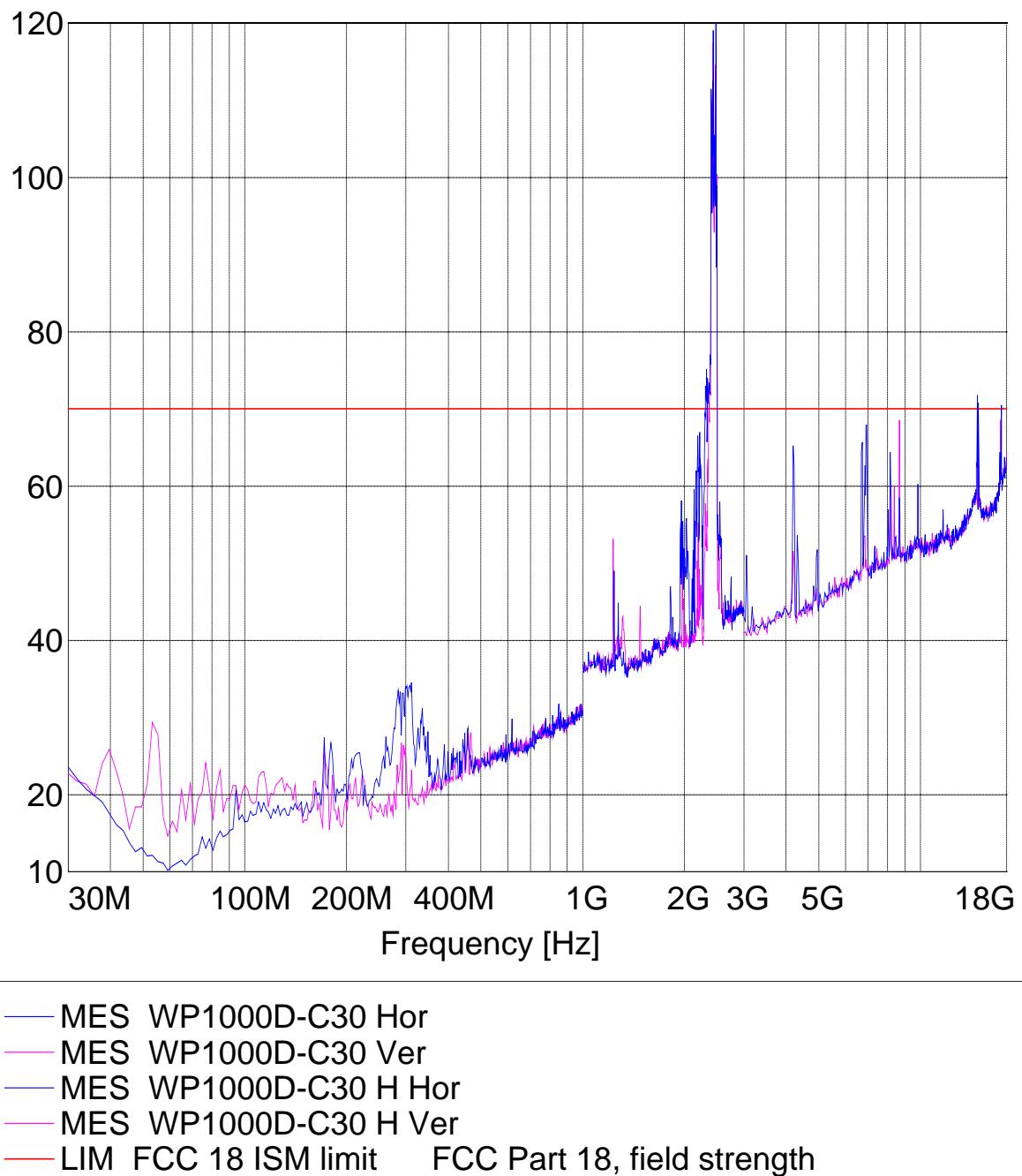
EUT: M/N:WD1000DI-C30C(A)  
Op Cond: 100 P  
Test Spec: N  
Comment: AC 120V/60Hz



## Radiated Disturbance

EUT: M/N:WD1000DI-C30C(A)  
Operating Condition: 100P  
Test Site: SMQ EMC Lab.SAC  
Test Specification: Horizontal & Vertical  
Comment: AC 120V/60Hz

Level [dBuV/m]



Radiated Disturbance

FCC Part 18

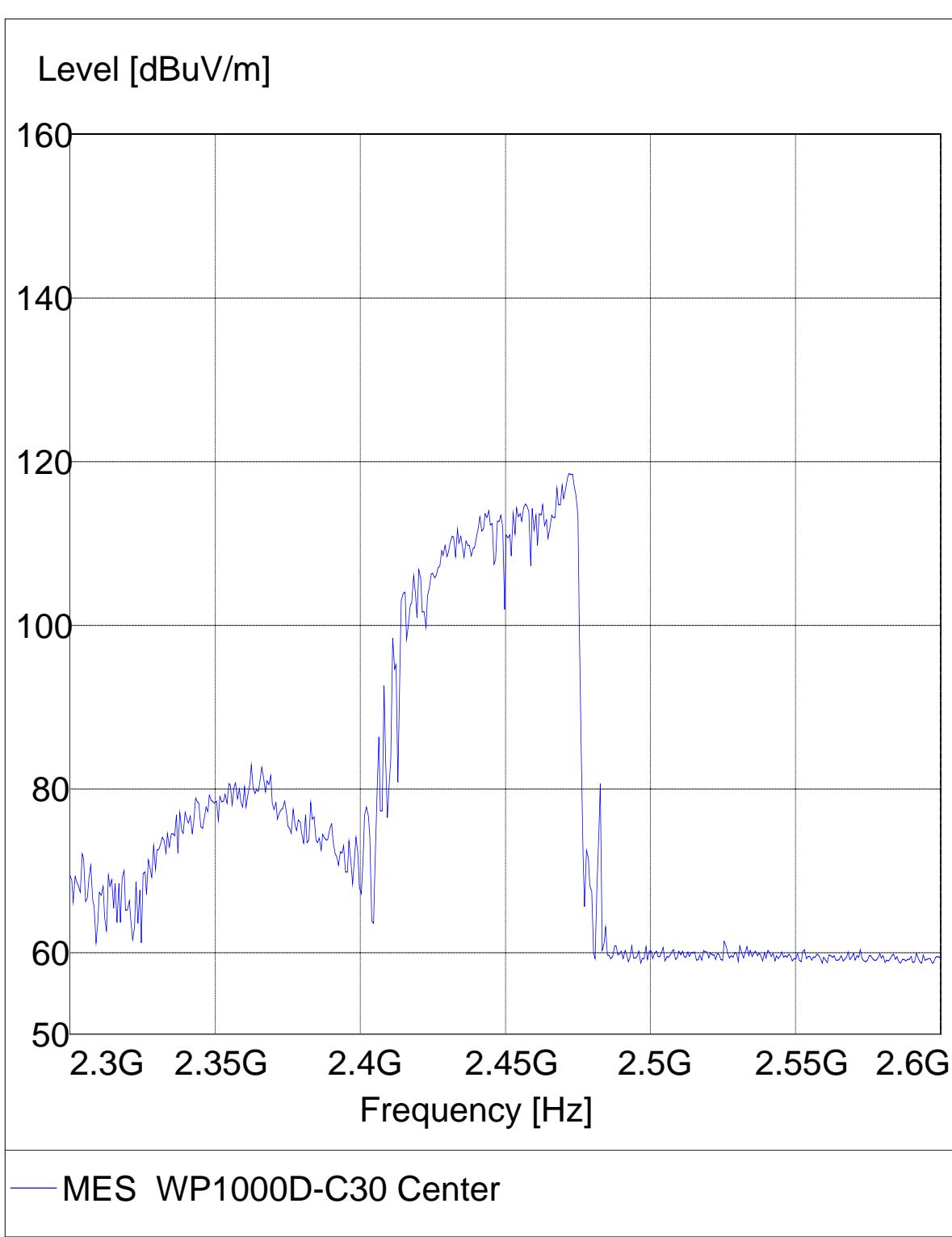
EUT: M/N:WD1000DI-C30C(A)

Operating Condition: 100P

Test Site: SMQ EMC Lab. SAC

Test Specification: Vertical

Comment: AC 120V/60Hz

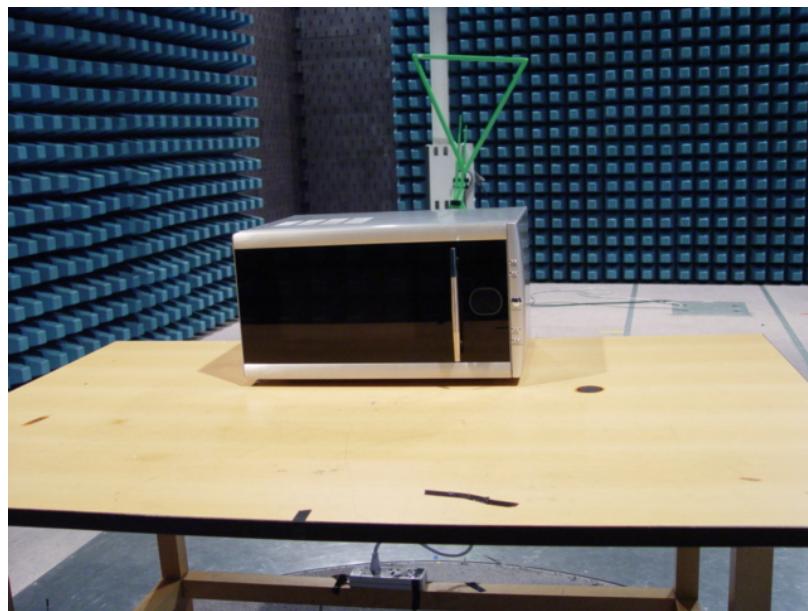


**APPENDIX II TEST PICTURE**

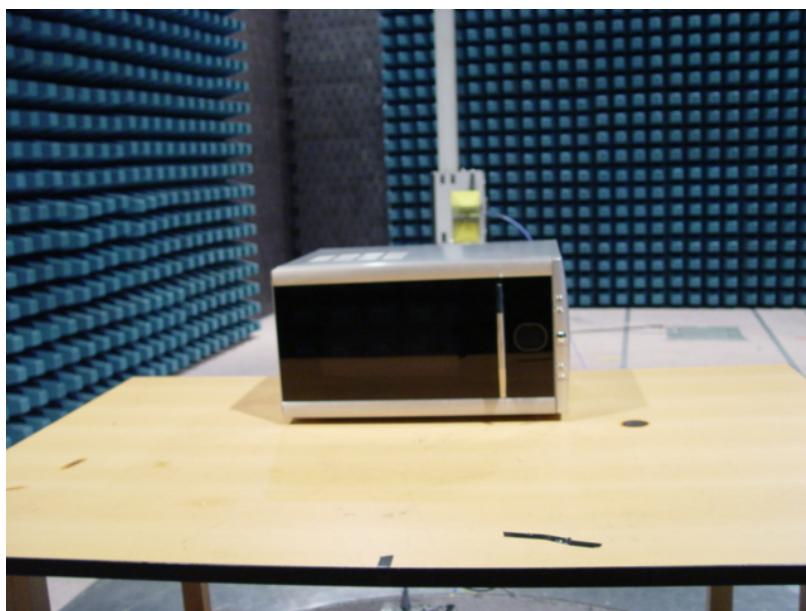
**Photo 1 Conducted Disturbance Test**



**Photo 2 Radiated disturbances (below 1GHz)**



**Photo 3 Radiated disturbances (Above 1GHz)**



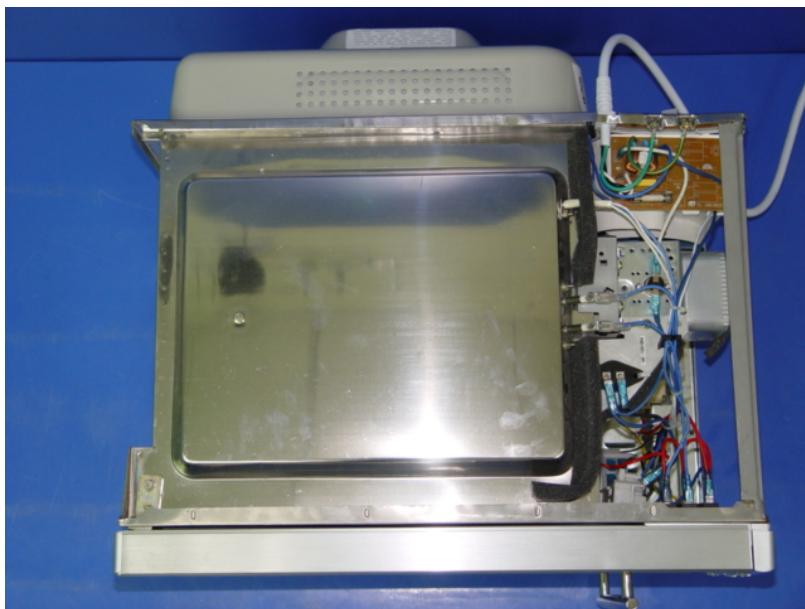
**Photo 4 Appearance of EUT**



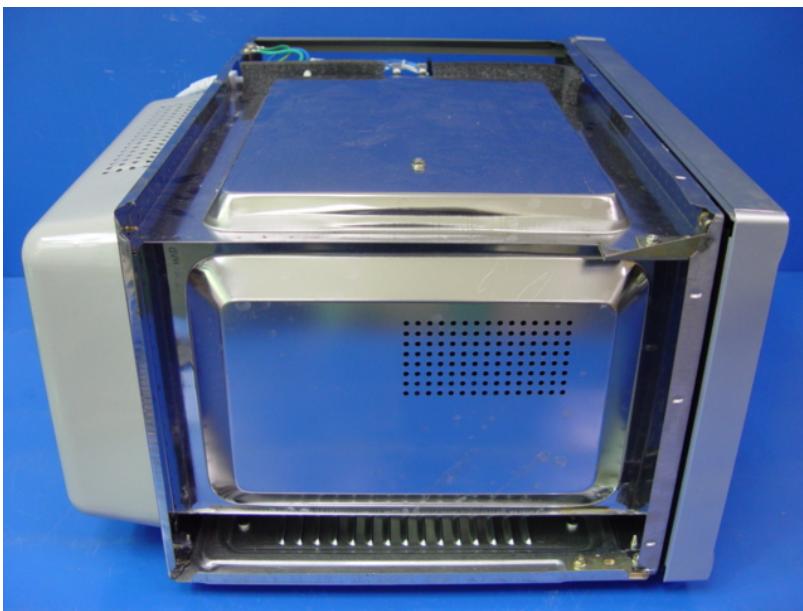
**Photo 5 Appearance of EUT**



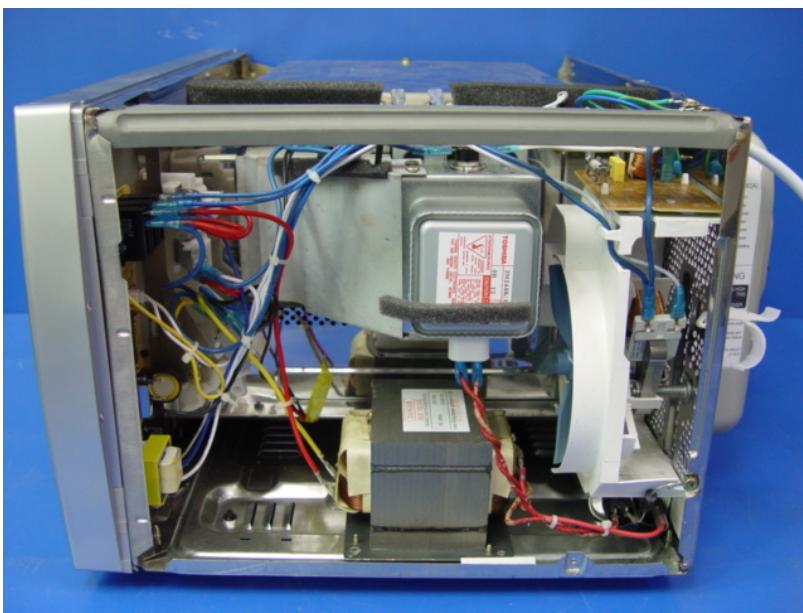
**Photo 6 Inside of EUT**



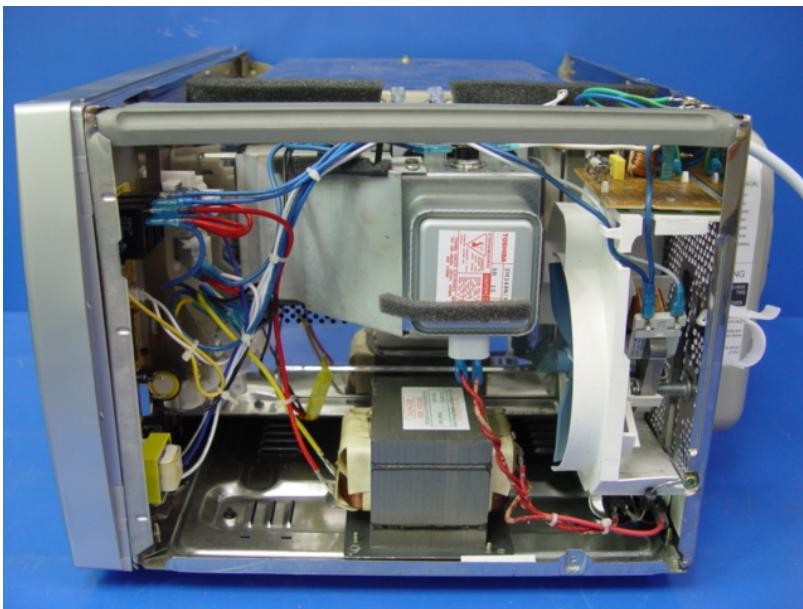
**Photo 7 Inside of EUT**



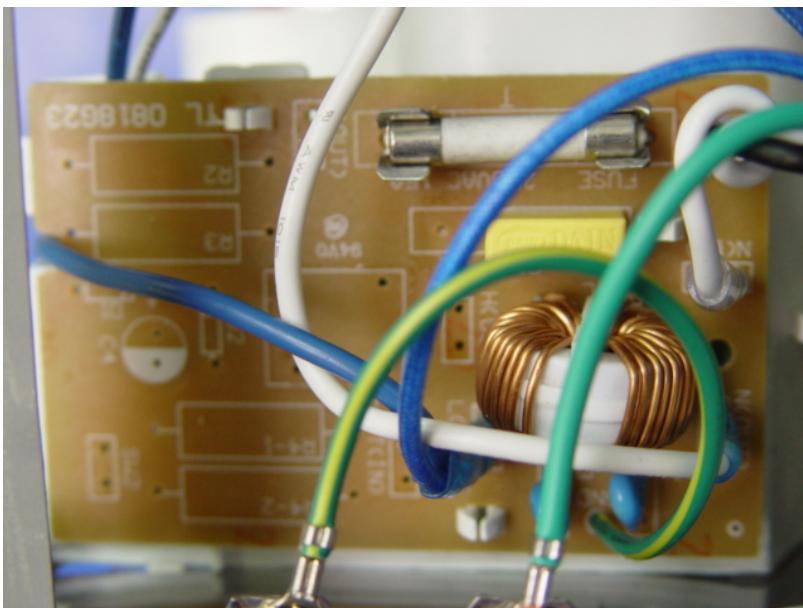
**Photo 8 Inside of EUT**



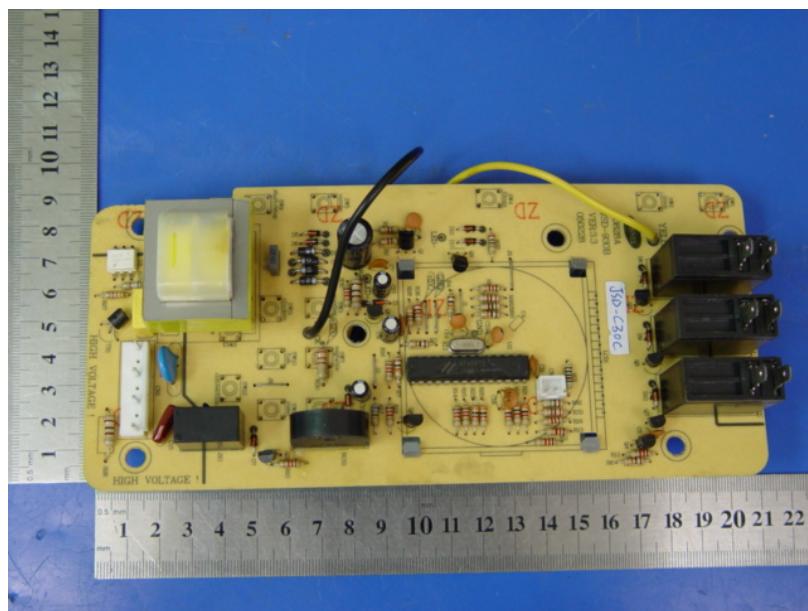
**Photo 9 Inside of EUT**



**Photo 10 Inside of EUT**



**Photo 11 Inside of EUT**



**Photo 12 Inside of EUT**

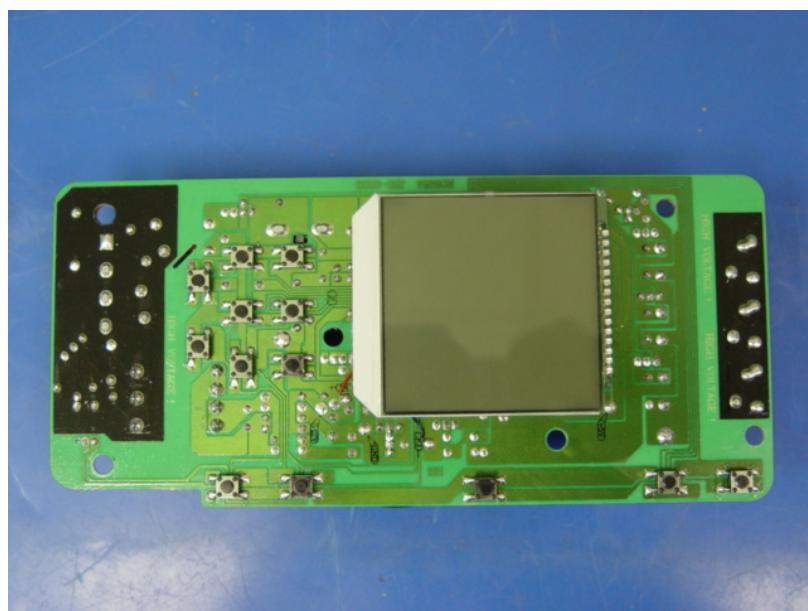


Photo 13 Inside of EUT

