

EMC TEST REPORT

For

Microwave Oven

**Model Number: MEW60A-A, MEW60A-B
FCC ID: NRTSZJENSMWO30LA**

Report Number : WT108001163

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection
Site Location	:	National Testing Center for Digital Electronic Products Bldg. Metrology and Quality Inspection, Longzhu Road, Shenzhen, Guangdong, China
Tel	:	0086-755-26941599
Fax	:	0086-755-26941545
Web	:	www.smq.com.cn

TEST REPORT DECLARATION

Applicant : Shenzhen Jens Electric Co., Ltd.
Address : Block 71, Changxing Industrial Zone, Gongming Town, Baoan, Shenzhen, China.
Manufacturer : Shenzhen Jens Electric Co., Ltd.
Address : Block 71, Changxing Industrial Zone, Gongming Town, Baoan, Shenzhen, China.
EUT Description : Microwave oven
Model Number : MEW60A-A, MEW60A-B
FCC ID : NRTSZJENSMWO30LA

Test Standards:

FCC Part 18 18.301, 18.305, 18.307

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 data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003), FCC MP-5 and the energy emitted by the sample EUT tested as described in this report is in compliance with FCC Rules Part 18.301, 18.305, 18.307.

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

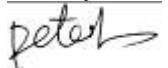
Tested by:	 _____ (Ryan Chen)	Date:	<u>Aug.09.2010</u>
Checked by:	 _____ (Dewelly Yang)	Date:	<u>Aug.09.2010</u>
Approved by:	 _____ (Peter Lin)	Date:	<u>Aug.09.2010</u>

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1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
Conducted Disturbance	18.307	Pass
Radiated disturbance	18.305	Pass
Operating Frequency	18.301	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 Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS 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

Conducted Emission

9kHz~30MHz 3.5dB

Radiated Emission

30MHz~1000MHz 4.5dB

1GHz~18GHz 4.6dB

3. PRODUCT DESCRIPTION

3.1. EUT Description

Description : Microwave oven
Applicant : MEW60A-A, MEW60A-B
Model Number : Shenzhen Jens Electric Co., Ltd.
Input : AC120V/60Hz
Rated Microwave Power : 1000W
Magnetron : JENS JM001

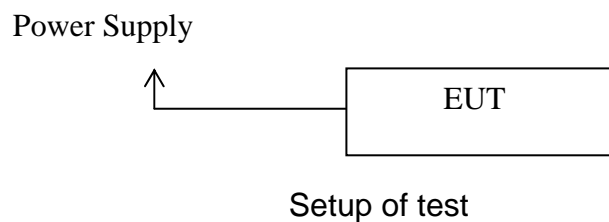
Remark: The sameness and differences between MEW60A-A and MEW60A-B are as follows:

- 1, Above two models belong to the same series products, most relevant parameter, such as microwave input power, output power, cavity capacity, interlock switch, and all safety component, are exactly the same.
- 2, Above two products are all digital controlled.
- 3, The difference between both models:
The model name, control board and oven door's appearance.

3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: NRTSZJENSMWO30LA filing to comply with Section 18.301, 18.305, 18.307 of the FCC Part 18, Subpart C Rules.

3.3. Block Diagram of EUT Configuration



3.4. Operating Condition of EUT

Test mode 1: Full power microwave output

3.5. Support Equipment

N/A

3.6. Test Conditions

Date of test: Jul.08, 2010-Jul.20, 2010

Date of EUT Receive: Jul.05, 2010

Temperature: 22-27 °C

Relative Humidity: 46-61%

3.7. 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
SB2603	EMI Test Receiver	Rohde & Schwarz	ESCS30	Jan.22, 2010	1 Year
SB4357	AMN	Rohde & Schwarz	ESH2-Z5	Jan.22, 2010	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.22, 2010	1 Year
SB3440	Bilog Antenna	Chase	CBL6112B	Jan.22, 2010	1 Year
SB3435	Horn Antenna	Rohde & Schwarz	HF906	Jan.22, 2010	1 Year

4.3. Test Equipment Used to Measure Input Power

Table 4 Input Power Test Equipment

No.	Equipment	Manufacturer	Model No.	LAST CALIB	Period
SB2588	Power	CI	5001ix-CTS-400	Jan.25,2010	1 Year
SB2588/01	Three Phase Harmonic flicker test system	CI	PACS-3	Jan.25,2010	1 Year
SB2588/02	Power	CI	5001ix-CTS-400-NO	Jan.25,2010	1 Year
SB2588/03	Power	CI	5001ix-CTS-400-NO	Jan.25,2010	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 5 Conducted Disturbance Test Limit (Part 18 consumer device)

Frequency	Limit (dB μ 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 was set up according to the guideline of ANSI C63.4: 2003 & FCC MP-5 for conducted emissions. The EUT is put on a table of non-conducting material that is 40cm high. The vertical conducting wall of shielding is located 80cm 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

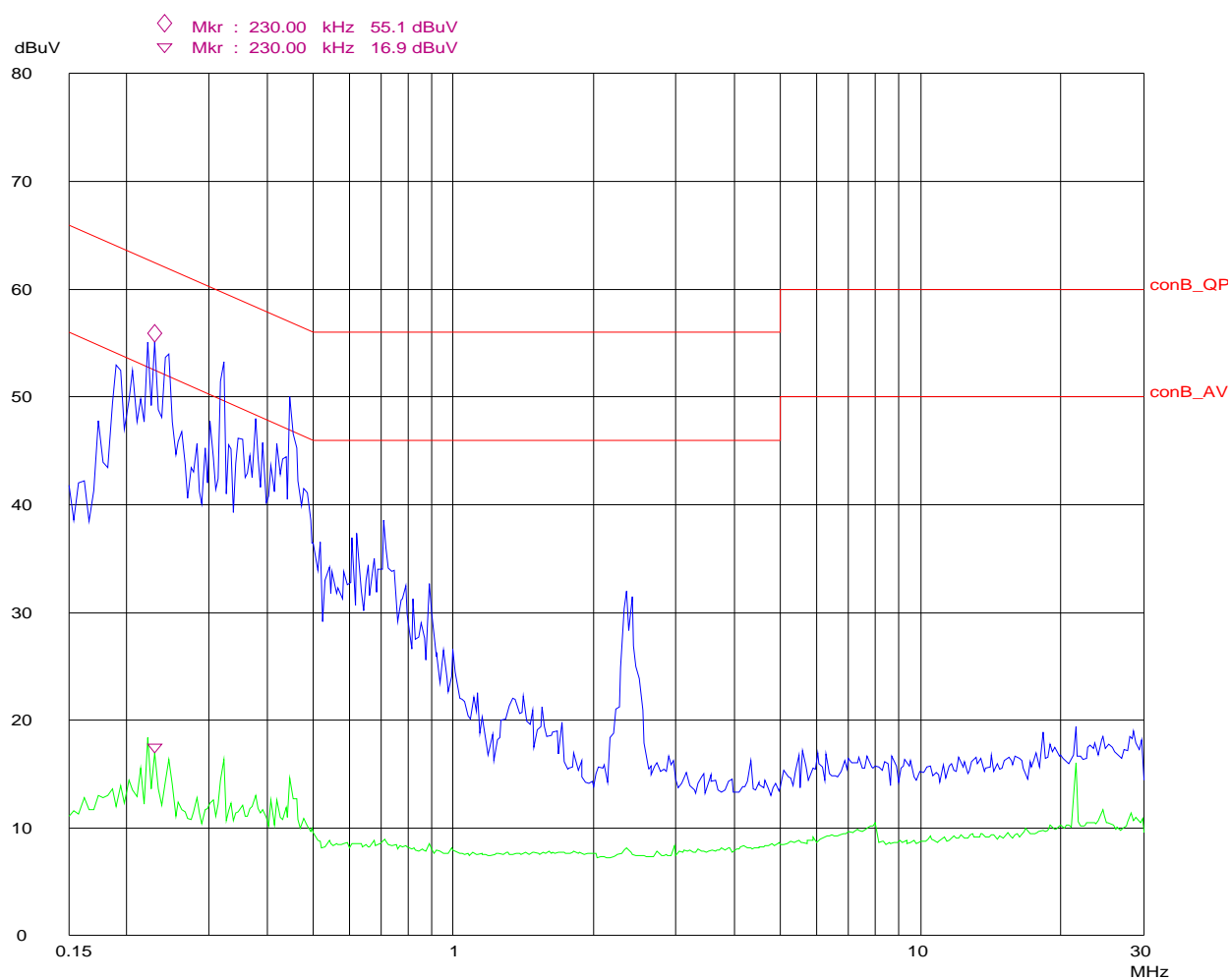
The emissions don't show in below are too low against the limits, the test curves are shown in the APPENDIX I

Table 6 Conducted Disturbance Test Data

Model No.: MEW60A-A									
Test Mode: 1									
Line					Neutral				
Frequency (MHz)	Quasi-Peak		Average		Frequency (MHz)	Quasi-Peak		Average	
	Reading (dB μ V)	Limit (dB μ V)	Reading (dB μ V)	Limit (dB μ V)		Reading (dB μ V)	Limit (dB μ V)	Reading (dB μ V)	Limit (dB μ V)
0.194	42.4	63.9	12.7	53.9	0.162	47.2	65.4	13.5	55.4
0.246	47.3	61.9	17.1	51.9	0.174	45.7	64.8	16.0	54.8
0.322	42.9	59.7	14.7	49.7	0.20	239.8	63.5	12.0	53.5
0.378	38.6	58.3	11.2	48.3	0.246	34.1	61.9	11.8	51.9
0.446	39.1	56.9	12.8	46.9	0.450	39.3	56.9	13.0	46.9
0.710	28.2	56	8.7	46	0.906	24.6	56	9.1	46

Conducted Disturbance

EUT: M/N:MEW60A-A
Op Cond: Full power microwave output
Test Spec: L
Comment: AC 120V/60Hz



Conducted Disturbance

EUT: M/N:MEW60A-A
Op Cond: Full power microwave output
Test Spec: N
Comment: AC 120V/60Hz

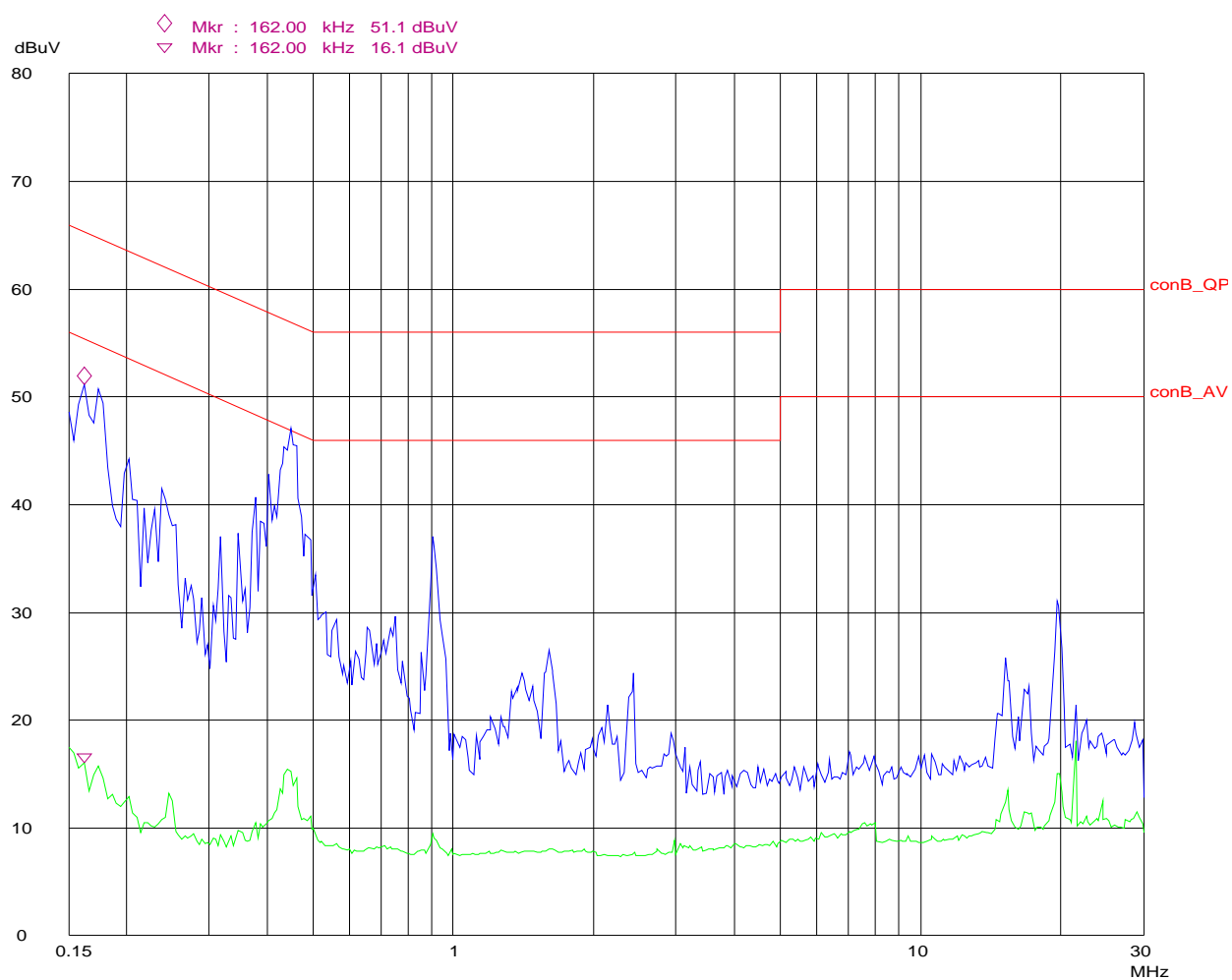
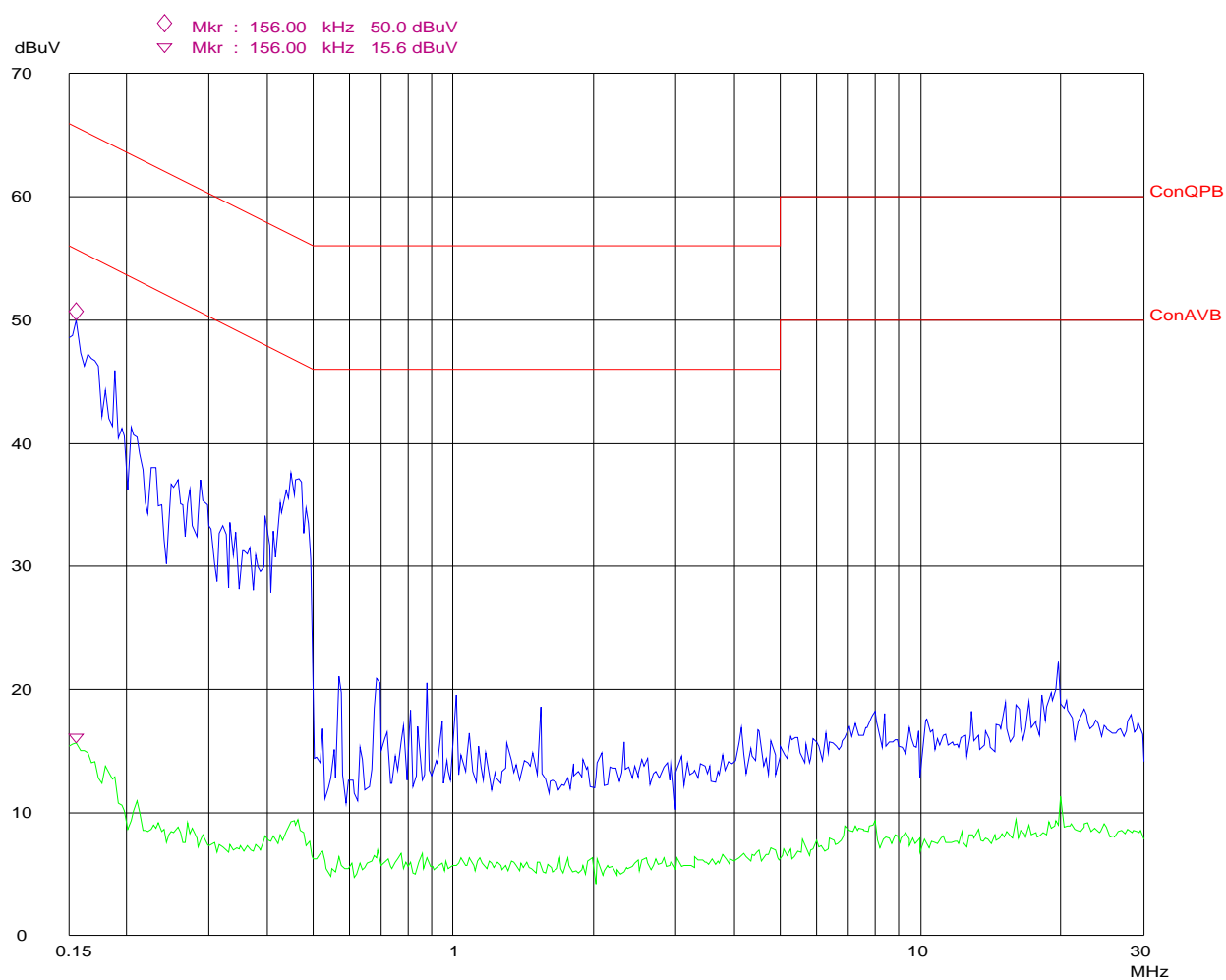


Table 7 Conducted Disturbance Test Data

Model No.: MEW60A-B									
Test Mode: 1									
Line					Neutral				
Frequency (MHz)	Quasi-Peak		Average		Frequency (MHz)	Quasi-Peak		Average	
	Reading (dB μ V)	Limit (dB μ V)	Reading (dB μ V)	Limit (dB μ V)		Reading (dB μ V)	Limit (dB μ V)	Reading (dB μ V)	Limit (dB μ V)
0.156	39.8	65.7	15.6	55.7	0.153	31.1	65.8	11.8	55.8
0.171	38.2	64.9	16.5	54.9	0.192	32.1	63.9	9.6	53.9
0.189	35.3	64.1	15.7	54.1	0.225	32.5	62.6	9.9	52.6
0.210	33.5	63.2	14.5	53.2	0.331	27.9	59.4	8.3	49.4
0.450	32.3	56.9	13.9	46.9	0.399	28.1	57.9	8.2	47.9
0.483	25.5	56.3	12.4	46.3	0.456	28.5	56.8	8.1	46.8

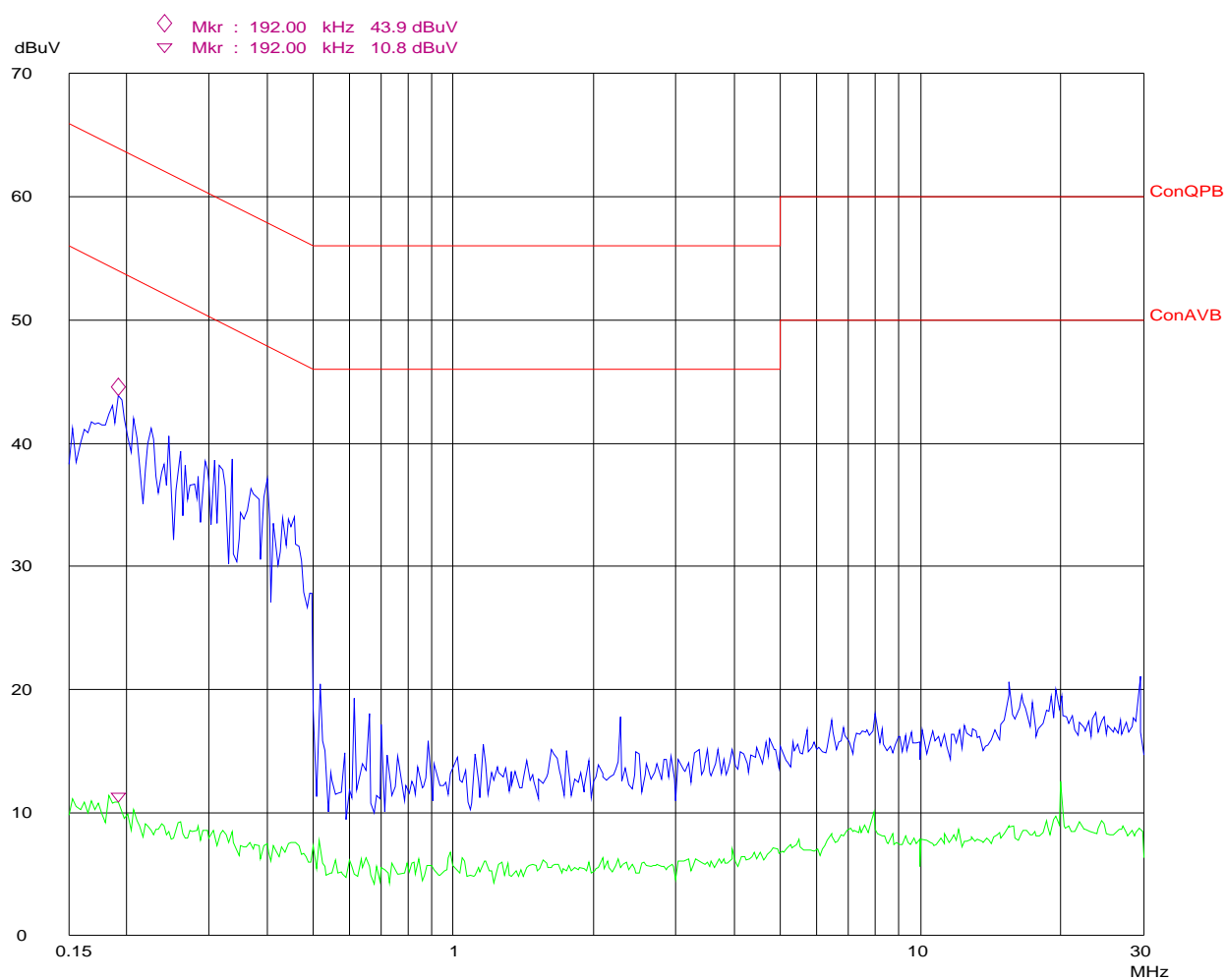
Conducted Disturbance

EUT: M/N:MEW60A-B
Op Cond: Full power microwave output
Test Spec: L
Comment: AC 120V/60Hz



Conducted Disturbance

EUT: M/N:MEW60A-B
Op Cond: Full power microwave output
Test Spec: N
Comment: AC 120V/60Hz



6. INPUT POWER MEASUREMENT

6.1. TEST PROCEDURE

The EUT was set up according to the FCC MP-5 and FCC Part 18 for Input power measurement. Input power and current was measured using a power analyzer. A 1000ml water load was placed in the center of the oven and oven was operated at maximum output power.

A 1000ml water load was chosen for its compatibility with the procedure commonly used by manufacturers to determine their input ratings.

6.2. Test Data

Model No.: MEW60A-A

Magnetron type: JENS JM001

Input Voltage (Vac/Hz)	Measured Input Power (watts)	Rated Input Power (watts)
120/60	1640	1550

Model No.: MEW60A-B

Magnetron type: JENS JM001

Input Voltage (Vac/Hz)	Measured Input Power (watts)	Rated Input Power (watts)
120/60	1620	1550

7. 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.

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

Model No.: MEW60A-A

Magnetron type: JENS JM001

Quantity of Water(ml)	Starting Temperature (°C)	Final Temperature (°C)	Elapsed Time(Second)
1000	21.7	47.6	120

$$Power(W) = \frac{(4.2) * (1000) * (25.9)}{120}$$

$$Power (W) = 906.5$$

Model No.: MEW60A-B

Magnetron type: JENS JM001

Quantity of Water(ml)	Starting Temperature (°C)	Final Temperature (°C)	Elapsed Time(Second)
1000	27.9	53.8	120

$$Power(W) = \frac{(4.2) * (1000) * (25.8)}{120}$$

$$Power (W) = 903.0$$

8. RADIATED DISTURBANCE TEST

8.1. Test Standard and Limit

8.1.1. Test Standard

FCC Part 18

8.1.2. Test Limit

Table 8 Radiated Disturbance Test Limit

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

8.2. Test Procedure

The EUT was set up according to the guideline of ANSI C63.4: 2003 & FCC MP-5 for radiated emissions. 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. During the radiated emission test, the EMI test receiver was set with the following configurations:

<i>Frequency Range</i>	<i>R B/W</i>	<i>Video B/W</i>	<i>IF B/W</i>
30 – 1000 MHz	100 kHz	300 kHz	120 kHz
Above 1 GHz	1 MHz	30Hz	

Start Frequency	1 GHz
Stop Frequency	24.5 GHz
Sweep Speed.....	Auto
Video Bandwidth.....	30 Hz
Resolution Bandwidth.....	1 MHz

All data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz and average detection mode above 1GHz.

8.3. 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.

8.4. Field strength limit

Model No.: MEW60A-A		
RF output power (W)	LFS	dB(uV/M) @3m
906.5	$\begin{aligned} \text{LFS} &= 25 \times \text{SQRT} (\text{power output} / 500) \\ &= 25 \times \text{SQRT} (906.5 / 500) \\ &= 33.66 \end{aligned}$	70.5

Model No.: MEW60A-B		
RF output power (W)	LFS	dB(uV/M) @3m
903.0	$\begin{aligned} \text{LFS} &= 25 \times \text{SQRT} (\text{power output} / 500) \\ &= 25 \times \text{SQRT} (903.0 / 500) \\ &= 33.60 \end{aligned}$	70.5

8.5. Test Data

Emissions don't show below are too low against the limits, the data was shown the worst case only.

Table 9 Radiated Disturbance Test Data

Model No.: MEW60A-A						
Test Mode: 1						
Frequency MHz	Emission Level dB(μ V/m)	Cable loss	Antenna factor	Reading dB μ V	Polarization	Limits dB (μ V/m)
104.008	25.8	1.6	12.3	11.9	Horizontal	70.5
247.292	24.2	2.7	12.7	8.8	Horizontal	70.5
346.693	21.1	3.2	15.4	2.5	Horizontal	70.5
415.030	37.2	3.3	17.3	16.6	Horizontal	70.5
2217.292	30.2	-32.2	28.5	33.9	Horizontal	70.5
4883.541	43.3	-31.0	33.3	41.0	Horizontal	70.5
54.268	23.9	1.2	6.3	16.4	Vertical	70.5
165.330	22.7	2.2	10.6	9.9	Vertical	70.5
472.745	26.7	3.6	17.6	5.5	Vertical	70.5
2214.779	34.5	-32.2	28.5	38.2	Vertical	70.5
2686.132	32.5	-31.8	29.9	34.4	Vertical	70.5
4886.346	60.2	-31.0	33.3	57.9	Vertical	70.5

Table 10 Radiated Disturbance Test Data

Model No.: MEW60A-B						
Test Mode: 1						
Frequency MHz	Emission Level dB(μ V/m)	Cable loss	Antenna factor	Reading dB μ V	Polarization	Limits dB (μ V/m)
47.453	23.2	1.2	9.4	12.6	Vertical	70.5
101.410	35.2	1.6	12.3	21.3	Vertical	70.5
118.022	28.4	1.9	12.7	13.8	Vertical	70.5
2279.879	27.8	-32.2	28.5	31.5	Vertical	70.5
2541.921	31.7	-31.8	29.9	33.6	Vertical	70.5
4923.360	57.5	-31.0	33.3	55.2	Vertical	70.5
8623.705	61.1	-28.3	37.5	51.9	Vertical	70.5
103.867	24.5	1.6	12.3	10.6	Horizontal	70.5
1232.701	47.7	-32.3	25.1	54.9	Horizontal	70.5
2317.306	27.8	-32.2	28.5	31.5	Horizontal	70.5
2520.478	29.6	-31.8	29.9	31.5	Horizontal	70.5
4928.511	51.9	-31.0	33.3	49.6	Horizontal	70.5
8616.887	36.5	-28.3	37.5	27.3	Horizontal	70.5

9. OPERATING FREQUENCY TEST

9.1. Test Standard

9.1.1. Test Standard

FCC Part 18

9.2. Test Procedure

The EUT was set up according to the FCC MP-5 and FCC Part 18 for Operating frequency measurement.

1) Variation in Operating Frequency with Time

The operating frequency was measured using a spectrum analyzer. Starting with the EUT at room temperature, a 1000ml water load was placed in the center of the oven and the oven was operated at maximum output power. The fundamental operating frequency was monitored until the water load was reduced to 20 percent of the original load.

2) Variation in Operating Frequency with Line Voltage

The EUT was operated/ warmed by at least 10minutes of use with a 1000ml water load at room temperature at the beginning of the test. Then the operating frequency was monitored as the input voltage was varied between 80 and 125 percent of the nominal rating.

9.3. Test Data

Table 11 Variation in Operating Frequency with Time (MEW60A-A)

Minimum Frequency (MHz)	Maximum Frequency (MHz)
2408.1	2482.3

Table 12 Variation in Operating Frequency with Line Voltage (MEW60A-A)

Minimum Frequency (MHz)	Maximum Frequency (MHz)
2405.4	2483.8

Note: Line voltage varied from 96Vac to 150Vac

Table 13 Variation in Operating Frequency with Time (MEW60A-B)

Minimum Frequency (MHz)	Maximum Frequency (MHz)
2401.3	2461.6

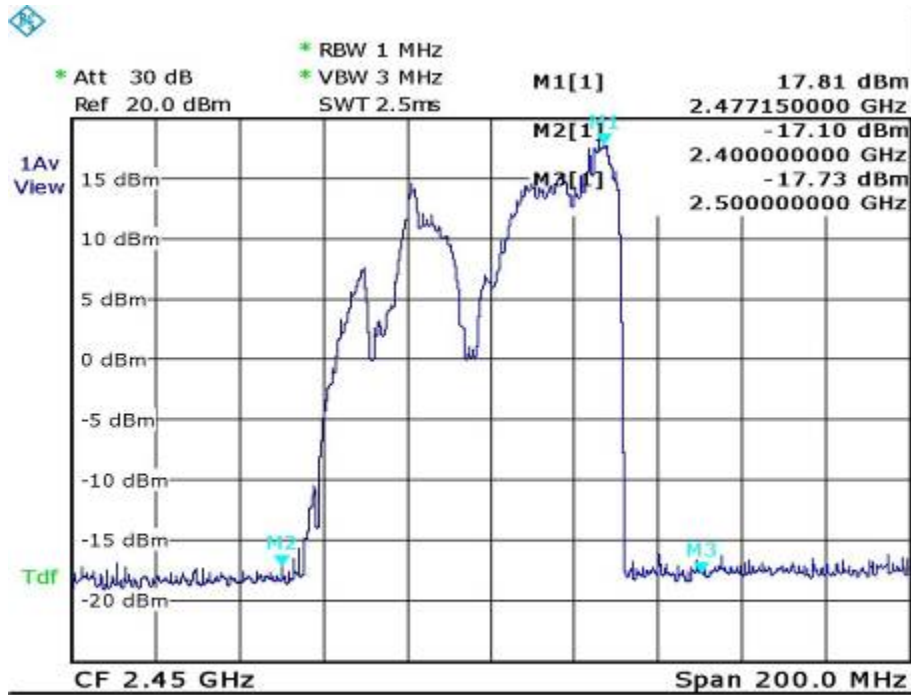
Table 14 Variation in Operating Frequency with Line Voltage (MEW60A-B)

Minimum Frequency (MHz)	Maximum Frequency (MHz)
2403.4	2468.8

Note: Line voltage varied from 96Vac to 150Vac

Operating Frequency

MEW60A-A



MEW60A-B

