

EXHIBIT E: TEST REPORT



SIMT

No.L0134

NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA
SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY

检测报告编号: 2006J10-30-112064
Test Report series No.

TEST REPORT

华东国家计量测试中心
上海市计量测试技术研究院

检 测 报 告

| | |
|-------------------------------|--|
| 委托者 Customer | 上海松下微波炉有限公司 Panasonic Home Appliances Microwave Oven (Shanghai) Co., Ltd. |
| 委托者地址 Address of customer | 上海浦东新区龙东大道 898 号 No. 898 Long Dong Rd. PuDong, Shanghai |
| 样品名称 Name of sample | 微波炉 Microwave Oven |
| 制造厂 Manufacturer | 上海松下微波炉有限公司 Panasonic Home Appliances Microwave Oven (Shanghai) Co., Ltd. |
| 型号/规格 Model/ Specification | NN-SD297 |
| 样品编号 No. of sample | PP07001 (NN-SD297) |



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检 测 员 张亮
Tested by

检测日期 2006 年 12 月 18 日
Date for test Year Month Day

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国家法定计量检定机构计量授权证书号（中心院）：（国）法计（2002）01039号/（2002）01019号
The number of the Certificate of Metrological Authorization to The Legal Metrological Verification Institution is No.（2002）01039 / No.（2002）01019

中国实验室国家认可委员会（CNAL）实验室认可证书号：No.L0134
The number of the certificate accredited by CNAL is No.L0134

本次检测所依据的技术规范（代号、名称）：
Reference documents for the test (code、name)

CISPR 11: 2004 Industrial, scientific and medical (ISM) radio-frequency equipment -
Electromagnetic disturbance characteristics - Limits and methods of
measurement

Refer to: FCC Part 18: 2004 Industrial, Scientific, and Medical Equipment

FCC/OST MP-5: 1986

本次检测所使用的主要测量仪器：
Main measuring instruments used in this test

Refer to Attachment 1

以上测量仪器的量值溯源至国家基准。

Quantity values of above measuring instruments used in this test are traced to those of the national primary standards in the P.R. China.

检测地点及环境条件：

Location and environmental condition for the test

地点： Shanghai Institute of Measurement and Testing Technology
Location

温度： 20-22 ; 湿度： 40-48 %RH ; 其它： /
Ambient temperature Relative humidity Others

检测结果的说明：

Description of results

Pass

本报告提供的结果仅对本次被检的样品有效。
The data are valid only for the sample(s).

检测数据/结果：
Data/Results of test

1. Description of EUT

| | |
|----------------------|----------------|
| Name of sample: | Microwave oven |
| Model No.: | NN-SD297 |
| Sample No.: | PP07001 |
| FCC ID No.: | ACLAP6Z01 |
| Operation frequency: | 2450MHz |
| Output rating: | 1200W |
| Magnetron type: | 2M261-M32 |
| Employed mode: | Turntable |
| Door seal type: | Choke |

2. Data summary

| Item | | Result |
|-----------------------------|--|---|
| Input power measurement | | Measured input power: 1264.8W |
| RF output power measurement | | Measured RF output power:1017.07W |
| Frequency measurement | Frequency vs Line voltage variation test (96~150V/1500ml water load) | Maximum frequency variation |
| | | Horizontal: 2457.05~2487.58MHz Vertical: 2454.64~2498.02MHz |
| | Frequency vs Load variation test (1500~300ml water load/ 120V) | Maximum frequency variation: |
| | | Horizontal: 2454.64~2490.38MHz Vertical: 2459.93~2490.22MHz |
| Radiated emission test | | See section 3.4 |
| Safety check | | Left side: 0.0263mW/cm ² Front side: 0.0663mW/cm ² Top side: 0.0203mW/cm ² Right side: 0.0156mW/cm ² Back side: 0.0128mW/cm ² Maximum: Front side: 0.0663mW/cm ² |
| Conducted emission test | | See section 3.6 |

3. Test data and results

3.1 Input power measurement

A beaker of 1050ml water was placed in the center of the microwave oven. The microwave oven worked at maximum power.

| Sample | Input voltage | Input current | Measured input power |
|----------|---------------|---------------|----------------------|
| NN-SD297 | 120V/60Hz | 10.54A | 1264.8W |

Test instrumentation

| Name/Model | Number |
|--|---------|
| Programmable AC Power Source CIF-5000FP | 979824 |
| Voltage Meter | D26/1-V |
| Current Meter | T19/1-A |

Test photograph



3.2 RF output power measurement

A beaker of 1500ml water was placed in the center of the oven. The oven worked at maximum output power for 120 seconds. The temperature of the water before and after this operation was measured and recorded. Redo above test three times and get the average.

| Model Number | Test | Temperature before test () | Temperature after test () | T () |
|--------------|------|-----------------------------|----------------------------|-------|
| NN-SD297 | 1 | 9.7 | 29.2 | 19.5 |
| | 2 | 9.2 | 28.6 | 19.4 |
| | 3 | 9.6 | 29 | 19.4 |

Temp. Rise= (Temperature after test- Temperature before test)/3=15.13
 RF output power=[(4.187 joules/Cal) x (Volume in ml) x (Temp. Rise)] / Time in seconds
 =(4.187x1500x19.433)/120=1017.07W

The measured output was found to be above 500W. Therefore, in accordance with section 18.305 of subpart C, the measured out-of-band emissions were compared to the 25xSQRT(power/500)[μV/m] @ 300m limit.

Test instrumentation

| Name/Model | Number |
|--|--------|
| Programmable AC Power Source CIF-5000FP | 979824 |
| Warranty Label testo 106-T1 | 63236 |

3.3 Frequency measurement

Following the above test, a beaker of 1500ml water was placed in the center of the oven. The oven worked at maximum power.

3.3.1 Frequency vs Line voltage variation test

The operating frequency was monitored as the input voltage was varied between 80 to 125 percent of the nominal rating. The results of this test are as follows. Line voltage varied from 96Vac to 150Vac.

| | |
|--------------|--|
| Model Number | Maximum frequency variation (96~150V/1500ml water load) |
| NN-SD297 | Horizontal: 2457.05~2487.58MHz |
| | Vertical: 2454.64~2498.02MHz |

3.3.2 Frequency vs Lode variation test

Initial load: 1500ml. Load at completion of test: 300ml.

| | |
|--------------|--|
| Model Number | Maximum frequency variation (1500~300ml water load/ 120V) |
| NN-SD297 | Horizontal: 2454.64~2490.38MHz |
| | Vertical: 2459.93~2490.22MHz |

Test instrumentation

| Name/Model | Number |
|--|----------|
| Double-Ridged Waveguide Horn Antenna HF 906 | 容-001-04 |
| Spectrum Analyzer R3162 | 容-001-33 |

Test photograph



3.4 Radiated Emission Test

A beaker of the water load was placed in the center of the oven and at the front right corner. The oven worked at maximum power.

| | |
|-----------------------------|---|
| Model Number: NN-SD297 | |
| The variable test condition | Antenna polarization: vertical & horizontal |
| | Water load position (in the center of the oven and at the front right corner) |
| | Turn table azimuth (0°~360°) |
| | Water load quantity (450ml & 1050ml) |

The test results is the maximized value as above test condition:

| Model Number: NN-SD297 | | | | | | |
|-----------------------------|----------------------|-----------------|------------------------|----------------------|-----------------------|-------------|
| Comment | Test Frequency (MHz) | Result (dBuV/m) | Result @ 300m (dBuV/m) | Antenna Polarization | Limit @ 300m (dBuV/m) | Margin (dB) |
| SIDE BAND | 2219.8 | 65.99 | 11.44859551 | Vertical | 35.66 | 24.21140449 |
| SIDE BAND | 2214.7 | 66.23 | 11.7413039 | Horizontal | 35.66 | 23.9186961 |
| SIDE BAND | 2698.9 | 67.54 | 16.45529776 | Vertical | 35.66 | 19.20470224 |
| SIDE BAND | 2701.4 | 67.44 | 16.27990902 | Horizontal | 35.66 | 19.38009098 |
| 2nd.Harmonic (1050mlcentre) | 4929.7 | 51.03 | 3.5604099 | Vertical | 35.66 | 32.0995901 |
| 2nd.Harmonic (1050mlcentre) | 4910.3 | 51.63 | 3.815047943 | Horizontal | 35.66 | 31.84495206 |
| 2nd.Harmonic (1050mlcorner) | 4918.2 | 52.15 | 4.050419451 | Vertical | 35.66 | 31.60958055 |
| 2nd.Harmonic (1050mlcorner) | 4914.3 | 51.36 | 3.698281798 | Horizontal | 35.66 | 31.9617182 |
| 2nd.Harmonic (450mlcentre) | 4921.5 | 50.57 | 3.376758486 | Vertical | 35.66 | 32.28324151 |
| 2nd.Harmonic (450mlcentre) | 4913.6 | 51.06 | 3.572728382 | Horizontal | 35.66 | 32.08727162 |
| 2nd.Harmonic (450mlcorner) | 4923.3 | 50.67 | 3.415859507 | Vertical | 35.66 | 32.24414049 |
| 2nd.Harmonic (450mlcorner) | 4914.5 | 50.72 | 3.435579479 | Horizontal | 35.66 | 32.22442052 |
| Spurious | 6495.6 | 58.52 | 8.433347578 | Vertical | 35.66 | 27.22665242 |
| Spurious | 6495.6 | 54.97 | 5.604024174 | Horizontal | 35.66 | 30.05597583 |
| Spurious | 7072.8 | 56.06 | 6.353309319 | Vertical | 35.66 | 29.30669068 |
| Spurious | 7071.6 | 56.93 | 7.022633437 | Horizontal | 35.66 | 28.63736656 |
| Spurious | 7901.6 | 61.17 | 11.4419488 | Vertical | 35.66 | 24.2180512 |
| Spurious | 7904.8 | 56.49 | 6.67574901 | Horizontal | 35.66 | 28.98425099 |
| 3nd.Harmonic (1050mlcentre) | 7366.7 | 55.09 | 5.681983916 | Vertical | 35.66 | 29.97801608 |
| 3nd.Harmonic (1050mlcentre) | 7345.6 | 59.56 | 9.506047937 | Horizontal | 35.66 | 26.15395206 |

| | | | | | | |
|--------------------------------|---------|-------|-------------|------------|-------|-------------|
| 3nd.Harmonic (1050mlcorner) | 7357.3 | 54.84 | 5.520774393 | Vertical | 35.66 | 30.13922561 |
| 3nd.Harmonic (1050mlcorner) | 7346.9 | 56.08 | 6.367955209 | Horizontal | 35.66 | 29.29204479 |
| 3nd.Harmonic (450mlcentre) | 7352.1 | 55.31 | 5.827737748 | Vertical | 35.66 | 29.83226225 |
| 3nd.Harmonic (450mlcentre) | 7350.2 | 56.44 | 6.637430704 | Horizontal | 35.66 | 29.0225693 |
| 3nd.Harmonic (450mlcorner) | 7353.4 | 54.98 | 5.61047976 | Vertical | 35.66 | 30.04952024 |
| 3nd.Harmonic (450mlcorner) | 7351.2 | 55.97 | 6.287818541 | Horizontal | 35.66 | 29.37218146 |
| 4th.Harmonic (1050mlcentre) | 9822.4 | 57.87 | 7.825282051 | Vertical | 35.66 | 27.83471795 |
| 4th.Harmonic (1050mlcentre) | 9834.4 | 54.93 | 5.578276021 | Horizontal | 35.66 | 30.08172398 |
| 5th.Harmonic (1050mlcentre) | 12280.8 | 57.36 | 7.379042301 | Horizontal | 35.66 | 28.2809577 |
| 5th.Harmonic (1050mlcentre) | 12291.3 | 56.73 | 6.862778784 | Vertical | 35.66 | 28.79722122 |

Test instrumentation

| Name/Model | Number |
|--|----------|
| EMI Test Receiver ESI 26 | 容-001-01 |
| Double-Ridged Waveguide Horn Antenna HF 906 | 容-001-04 |

Test photograph



3.5 Safety check

| | |
|--|---|
| Model No.: NN-SD297 | |
| At 1050ml water load was placed in the center of the oven. The temperature of the water is 20 degree. The oven worked at maximum power. The radiation emission was moved at 2.5cm/s around the oven. | |
| Safety check | Left side: 0.0263mW/cm ² Front side: 0.0663mW/cm ² Top side: 0.0203mW/cm ² Right side: 0.0156mW/cm ² Back side: 0.0128mW/cm ² Maximum: Front side: 0.0663mW/cm ² |

Test instrumentation

| Name/Model | Number |
|---------------------------|---------|
| E-Filed Sensor FMR-300 | 2244/31 |

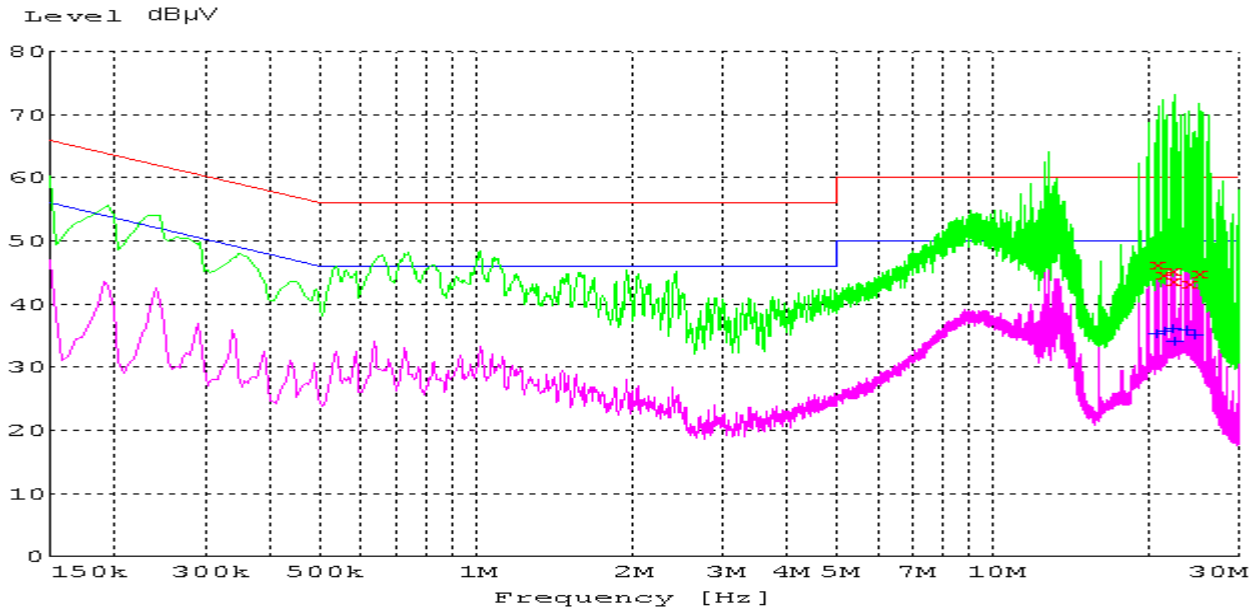
Test photograph



3.6 Conducted emission test

A beaker of 1050ml water was placed in the center of the microwave oven. The microwave oven worked at maximum power.

“L” line:



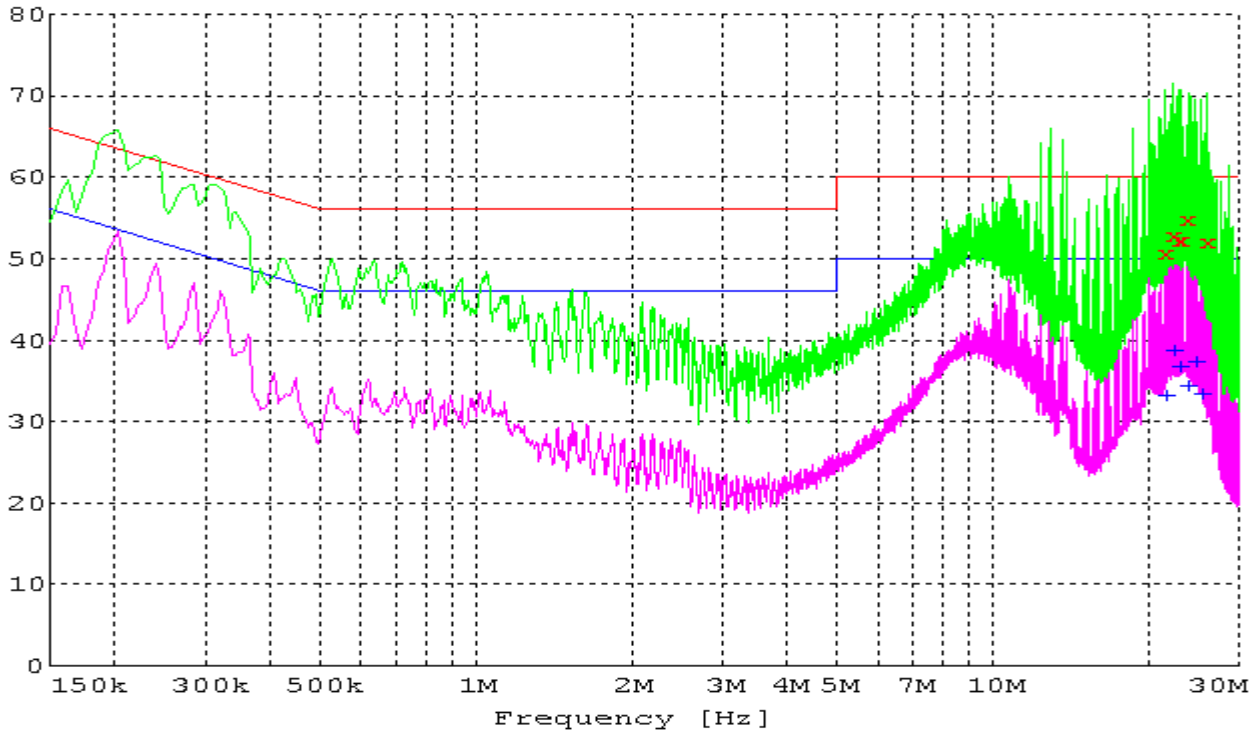
| | | | | |
|-----|-----|------------------|---------|------------------|
| × × | MES | C61218PA003L_fin | QP | |
| + + | MES | C61218PA003L_fin | AV | |
| — | MES | C61218PA003L_pre | PK | |
| — | MES | C61218PA003L_pre | AV | |
| — | LIM | FCC 18 | QP 2004 | Voltage QP Limit |
| — | LIM | FCC 18 | AV 2004 | Voltage AV Limit |

| Frequency (MHz) | QP-Level (dBµV) | Limit (dBµV) | Margin (dB) |
|-----------------|-----------------|--------------|-------------|
| 20.881500 | 46.50 | 60.00 | 13.50 |
| 21.448500 | 44.70 | 60.00 | 15.30 |
| 22.393500 | 45.40 | 60.00 | 14.60 |
| 22.443000 | 43.70 | 60.00 | 16.30 |
| 23.964000 | 43.30 | 60.00 | 16.70 |
| 25.125000 | 44.90 | 60.00 | 15.10 |

| Frequency (MHz) | AV-Level (dBµV) | Limit (dBµV) | Margin (dB) |
|-----------------|-----------------|--------------|-------------|
| 20.652000 | 35.30 | 50.00 | 14.70 |
| 21.381000 | 35.60 | 50.00 | 14.40 |
| 22.141500 | 36.00 | 50.00 | 14.00 |
| 22.393500 | 34.10 | 50.00 | 15.90 |
| 23.644500 | 35.80 | 50.00 | 14.20 |
| 24.400500 | 35.00 | 50.00 | 15.00 |

“N” line:

Level dB μ V



x x MES C61218PA003N_fin QP
 + + MES C61218PA003N_fin AV
 — MES C61218PA003N_pre PK
 — MES C61218PA003N_pre AV
 — LIM FCC 18 QP 2004 Voltage QP Limit
 — LIM FCC 18 AV 2004 Voltage AV Limit

| Frequency (MHz) | QP-Level (dB μ V) | Limit (dB μ V) | Margin (dB) |
|-----------------|-----------------------|--------------------|-------------|
| 21.588000 | 50.70 | 60.00 | 9.30 |
| 22.348500 | 52.90 | 60.00 | 7.10 |
| 23.046000 | 52.40 | 60.00 | 7.60 |
| 23.163000 | 52.30 | 60.00 | 7.70 |
| 23.910000 | 54.90 | 60.00 | 5.10 |
| 26.002500 | 52.20 | 60.00 | 7.80 |

| Frequency (MHz) | AV-Level (dB μ V) | Limit (dB μ V) | Margin (dB) |
|-----------------|-----------------------|--------------------|-------------|
| 21.588000 | 33.10 | 50.00 | 16.90 |
| 22.348500 | 38.70 | 50.00 | 11.30 |
| 23.046000 | 36.70 | 50.00 | 13.30 |
| 23.910000 | 34.30 | 50.00 | 15.70 |
| 24.580500 | 37.30 | 50.00 | 12.70 |
| 25.260000 | 33.30 | 50.00 | 16.70 |

Test instrumentation

| Name/Model | Number |
|------------------------------------|----------|
| EMI TEST RECEIVER ESCS 30 | 容-003-01 |
| ARTIFICIAL MAINS NETWORK ESH2Z5 | 容-003-05 |

Test photograph



Remark: /

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Attachment 1

本次检测所使用的主要测量仪器：
Main measuring instruments used in this test

| 名称/型号 Name/Model | 编号 Number | 证书编号/有效期限 Certificate No./Due date | 测量范围/准确度 Measuring range/accuracy |
|--|--------------|---------------------------------------|--|
| Programmable AC Power Source CIF-5000FP | 979824 | / | / |
| Warranty Label testo 106-T1 | 63236 | / | / |
| Double-Ridged Waveguide Horn Antenna HF 906 | 容-001-04 | XDdj2006-4022 2007.07.28 | 1 TO 18 GHz , NOMINAL IMPEDANCE : 50 Ohm, VSWR < 1.5, GAIN : 7 TO 14 dB (typ.) , RF CONNECTOR: N FEMALE , LINEAR POLARISED BROADBAND REANSMIT/REC.ANT. / Gain: 7-14dB typ. |
| Spectrum Analyzer R3162 | 容-001-33 | 2007.11.09 | 9kHz - 8 GHz, Sweep time: 20ms, MAX. input level: +30dBm, Frequency counter function with a resolution: 1Hz / ± 1% |
| EMI Test Receiver ESI 26 | 容-001-01 | 200605-1-020033 2007.01.03 | 20 Hz TO 26.5 GHz ; -150... +30dBm 20Hz-1GHz: ± 1.5dB, 1GHz-4.5GHz : ± 2dB , 4.5GHz-26.5GHz : ± 3dB |
| E-Filed Sensor FMR-300 | 2244/31 | / | / |
| EMI TEST RECEIVER ESCS 30 | 容-003-01 | 200605-1-020640 2007.05.18 | 9 kHz—2750 MHz , - 38—+ 137 dB μ V / S/N > 16 dB, 9kHz-1000MHz < 1dB, 1000-2750MHz < 1.5dB |
| ARTIFICIAL MAINS NETWORK ESH2-Z5 | 容-003-05 | 2006F00-10-311019 2007.08.30 | 9 kHz TO 30 MHz , Impedance accuracy: ± 20% , Continuous current: 4*25A, Max. short-time current: 4*50A(2 min), Max. AC supply voltage: 250 V rms |
| Voltage Meter D26-V | 容-019-28 | 200605-1-010039 2007.06.26 | 125-250-500V, 50Hz consume (VA) : 5/10/20; graduation: 125 |
| Current Meter T19-A | 容-019-30 | 200605-1-010036 2007.06.20 | 0 - 100A; graduation: 100 |

以上测量仪器的量值溯源至国家基准。

Quantity values of above measuring instruments used in this test are traced to those of the national primary standards in the P.R. China.