



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 _____ 上海松下微波炉有限公司
Customer Panasonic Home Appliances Microwave Oven (Shanghai) Co., Ltd.

委托者地址 _____ 上海浦东新区龙东大道 898 号
Address of customer No. 898 Long Dong Rd. PuDong, Shanghai

样品名称 _____ 微波炉
Name of sample Microwave Oven

制造厂 _____ 上海松下微波炉有限公司
Manufacturer Panasonic Home Appliances Microwave Oven (Shanghai) Co., Ltd.

型号/规格 _____ NN-SD797
Model/ Specification

样品编号 _____ PP07002 (NN-SD797)
No. of sample



报告批准人 _____ 黄伟
Approved by

核验员 _____ 黄友根
Checked by

检测员 _____ 张亮
Tested by

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

地址: 上海市张衡路 1500 号(总部) 电话: 021-38839800 传真: 021-50798390 邮编: 201203
Address: No. 1500 Zhangheng Road, Shanghai(headquarters) Tel. Fax. Post Code

上海市宜山路 716 号(分部) 电话: 021-64701390 传真: 021-64701810 邮编: 200233
No. 716 Yishan Road, Shanghai(branch) Tel. Fax. Post Code

投诉电话: 021-50798262

Tel. for complaint

未经本院批准, 部分采用本证书内容无效。

Partly using this certificate will not be admitted unless allowed by SIMT.

第 1 页 共 12 页
Page of total pages

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-SD797
Sample No.:	PP07002
FCC ID No.:	ACLAP7B51
Operation frequency:	2450MHz
Output rating:	1250W
Magnetron type:	2M261-M32
Employed mode:	Turntable
Door seal type:	Choke

2. Data summary

Item	Result
Input power measurement	Measured input power: 1606.8W
RF output power measurement	Measured RF output power: 1024.24W
Frequency measurement	Frequency vs Line voltage variation test (96~150V/1500ml water load) Maximum frequency variation Horizontal: 2439.25~2473.38MHz Vertical: 2444.55~2471.71MHz
	Frequency vs Load variation test (1500~300ml water load/ 120V) Maximum frequency variation: Horizontal: 2441.17~2464.24MHz Vertical: 2445.03~2471.71MHz
Radiated emission test	See section 3.4
Safety check	Left side: 0.0923mW/cm ² Front side: 0.0798mW/cm ² Top side: 0.0958mW/cm ² Right side: 0.1127mW/cm ² Back side: 0.1432mW/cm ² Maximum: Back side: 0.1432mW/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-SD797	120V/60Hz	13.39A	1606.8W

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-SD797	1	10.1	30.2	20.1
	2	9.9	29.7	19.8
	3	10.4	29.2	18.8

Temp. Rise= (Temperature after test- Temperature before test)/3=19.57

RF output power=[(4.187 joules/Cal) x (Volume in ml) x (Temp. Rise)] / Time in seconds
=(4.187x1500x19.57)/120=1024.24W

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 $25 \times \text{SQRT}(\text{power}/500) [\mu\text{V}/\text{m}]$ @ 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-SD797	Horizontal: 2439.25~2473.38MHz Vertical: 2444.55~2471.71MHz

3.3.2 Frequency vs Load variation test

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

Model Number	Maximum frequency variation (1500~300ml water load/ 120V)
NN-SD797	Horizontal: 2441.17~2464.24MHz Vertical: 2445.03~2471.71MHz

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-SD797	
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-SD797						
Comment	Test Frequency (MHz)	Result (dBuV/m)	Result @ 300m (dBuV/m)	Antenna Polarization	Limit @ 300m (dBuV/m)	Margin (dB)
SIDE BAND	2203.3	67.75	13.91179421	Vertical	35.78	21.86820579
SIDE BAND	2219.8	65.54	10.87056736	Horizontal	35.78	24.90943264
SIDE BAND	2708.4	69.96	21.80812105	Vertical	35.78	13.97187895
SIDE BAND	2704.3	67.54	16.48362979	Horizontal	35.78	19.29637021
2nd.Harmonic (1050mlcentre)	4916.9	58.23	8.156427871	Vertical	35.78	27.62357213
2nd.Harmonic (1050mlcentre)	4893.9	55.03	5.642869413	Horizontal	35.78	30.13713059
2nd.Harmonic (1050mlcorner)	4892.8	57.74	7.709034691	Vertical	35.78	28.07096531
2nd.Harmonic (1050mlcorner)	4897.6	54.57	5.351801538	Horizontal	35.78	30.42819846
2nd.Harmonic (450mlcentre)	4897.3	56.79	6.910349294	Vertical	35.78	28.86965071
2nd.Harmonic (450mlcentre)	4904.4	54.44	5.272298614	Horizontal	35.78	30.50770139
2nd.Harmonic (450mlcorner)	4902.3	57.15	7.202777512	Vertical	35.78	28.57722249
2nd.Harmonic (450mlcorner)	4903.1	54.78	5.482769649	Horizontal	35.78	30.29723035
Spurious	5194.1	66.72	21.67704105	Vertical	35.78	14.10295895
Spurious	5169.6	58.22	8.14704284	Horizontal	35.78	27.63295716
Spurious	6559.3	59.92	9.908319449	Vertical	35.78	25.87168055
Spurious	6546.5	56.72	6.854882265	Horizontal	35.78	28.92511774
Spurious	7074.3	65.09	17.9680108	Vertical	35.78	17.8119892
Spurious	7074.8	63.23	14.50440774	Horizontal	35.78	21.27559226
3nd.Harmonic (1050mlcentre)	7311.6	66.08	20.1372425	Vertical	35.78	15.6427575
3nd.Harmonic (1050mlcentre)	7340.8	62.92	13.99587323	Horizontal	35.78	21.78412677
3nd.Harmonic (1050mlcorner)	7328.8	67.86	24.71724145	Vertical	35.78	11.06275855

3nd.Harmonic (1050mlcorner)	7327.4	70.09	31.95214365	Horizontal	35.78	3.827856352
3nd.Harmonic (450mlcentre)	7327.4	67.47	23.63197399	Vertical	35.78	12.14802601
3nd.Harmonic (450mlcentre)	7319.7	69.13	28.60882361	Horizontal	35.78	7.171176394
3nd.Harmonic (450mlcorner)	7326.2	66.56	21.28139046	Vertical	35.78	14.49860954
3nd.Harmonic (450mlcorner)	7321.1	68.42	26.36331386	Horizontal	35.78	9.416686142
4th.Harmonic (1050mlcentre)	9801.6	57.55	7.542233958	Vertical	35.78	28.23776604
4th.Harmonic (1050mlcentre)	9803.2	58.07	8.007556285	Horizontal	35.78	27.77244371
5th.Harmonic (1050mlcentre)	12246.1	66.33	20.7252606	Horizontal	35.78	15.0547394
5th.Harmonic (1050mlcentre)	12254.2	61.27	11.57444032	Vertical	35.78	24.20555968

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



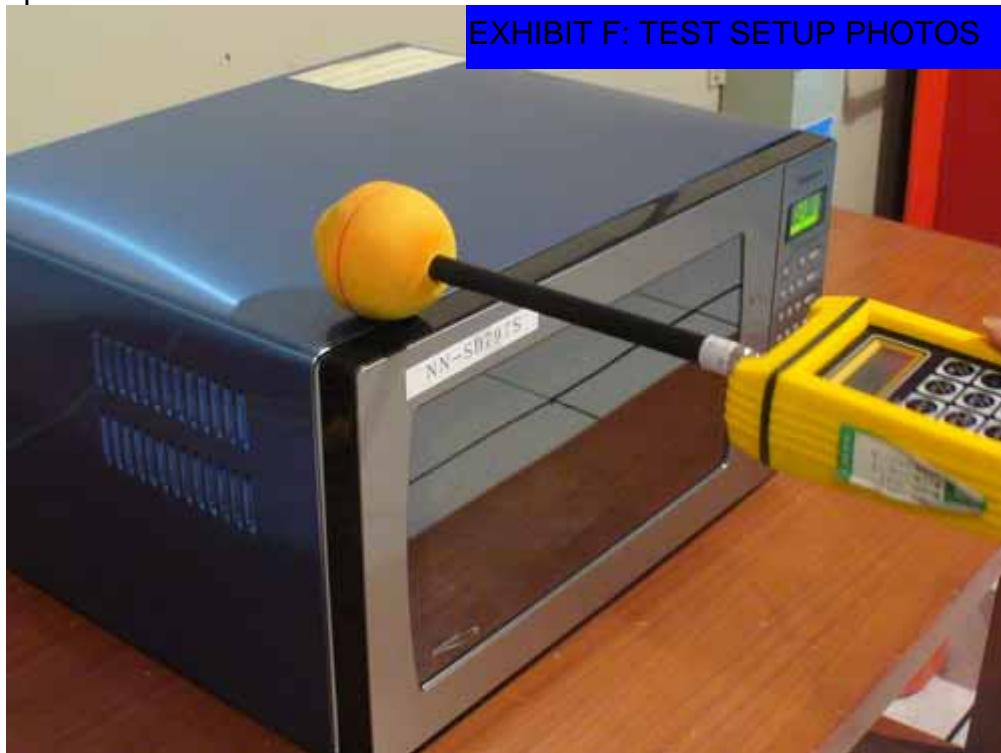
3.5 Safety check

Model No.: NN-SD797	
At 275ml 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	<p>Left side: 0.0923mW/cm² Front side: 0.0798mW/cm² Top side: 0.0958mW/cm² Right side: 0.1127mW/cm² Back side: 0.1432mW/cm² Maximum: Back side: 0.1432mW/cm²</p>

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:

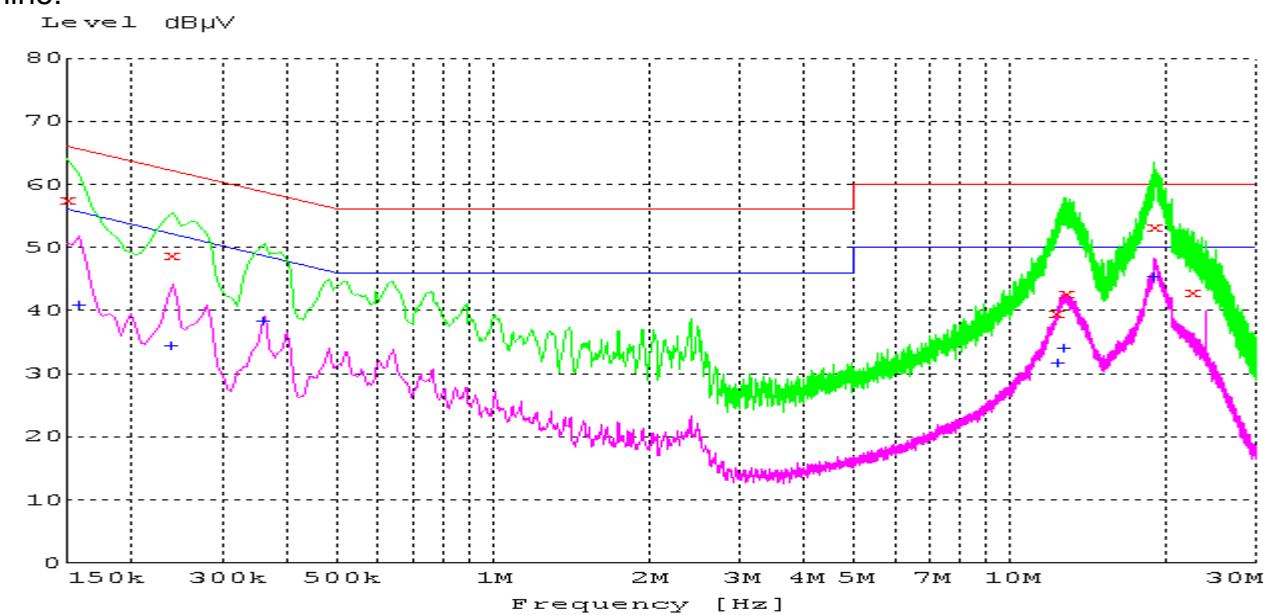


Table showing QP and AV limits for the conducted emission test:

Frequency (MHz)	QP-Level (dB μ V)	Limit (dB μ V)	Margin (dB)
0.150000	57.70	66.00	8.30
0.240000	48.90	62.10	13.20
12.273000	39.70	60.00	20.30
12.876000	42.80	60.00	17.20
19.072500	53.40	60.00	6.60
22.542000	43.00	60.00	17.00

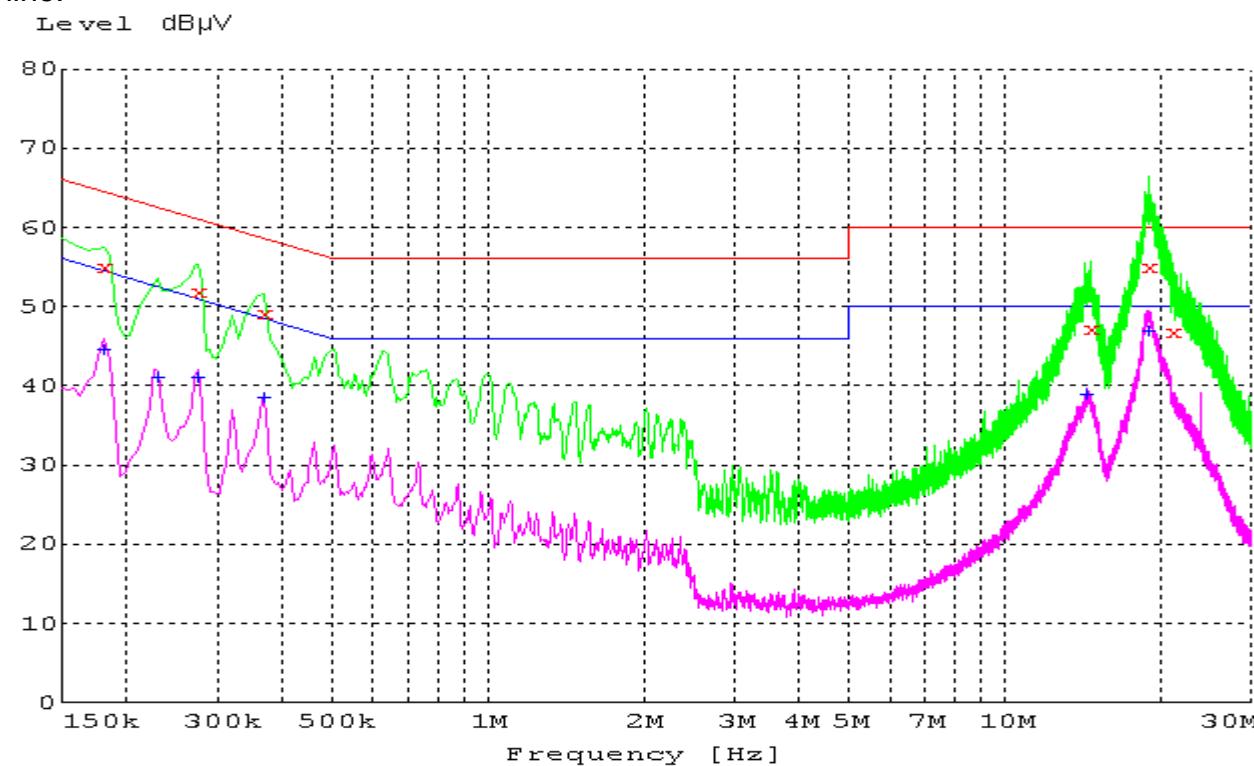
Table showing QP and AV limits for the conducted emission test:

Frequency (MHz)	QP-Level (dB μ V)	Limit (dB μ V)	Margin (dB)
0.159000	40.80	55.50	14.70
0.240000	34.30	52.10	17.80
0.361500	38.30	48.70	10.40
12.376500	31.50	50.00	18.50
12.736500	33.90	50.00	16.10
19.072500	45.20	50.00	4.80

Table showing QP and AV limits for the conducted emission test:

Frequency (MHz)	AV-Level (dB μ V)	Limit (dB μ V)	Margin (dB)
0.159000	40.80	55.50	14.70
0.240000	34.30	52.10	17.80
0.361500	38.30	48.70	10.40
12.376500	31.50	50.00	18.50
12.736500	33.90	50.00	16.10
19.072500	45.20	50.00	4.80

“N” line:



xx MES C61218PA002N_fin QP
++ MES C61218PA002N_fin AV
— MES C61218PA002N_pre PK
— MES C61218PA002N_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)
0.181500	55.10	64.40	9.30
0.276000	52.00	60.90	8.90
0.370500	49.30	58.50	9.20
14.658000	47.30	60.00	12.70
19.086000	55.00	60.00	5.00
21.219000	46.90	60.00	13.10

Frequency (MHz)	AV-Level (dB μ V)	Limit (dB μ V)	Margin (dB)
0.181500	44.60	54.40	9.80
0.231000	40.90	52.40	11.50
0.276000	41.00	50.90	9.90
0.370500	38.50	48.50	10.00
14.451000	38.80	50.00	11.20
19.072500	46.90	50.00	3.10

Test instrumentation

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

Test photograph



Remark: /

Follow is blank

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.