

EXHIBIT E: TEST REPORT



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

检测报告编号: 2007J10-30-101008  
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 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-SD377S  
Model/ Specification

样品编号 PP07006  
No. of sample



报告批准人 黄坛  
Approved by

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Checked by

检 测 员 张亮  
Tested by

检测日期 2007 年 01 月 10-12 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

详见附件一 (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：上海市计量测试技术研究院  
Location Shanghai Institute of Measurement and Testing Technology

温度：20-24 ; 湿度：40-41 %RH ; 其它： /  
Ambient temperature Relative humidity Others

检测结果的说明：

Description of results

符合检测依据要求 (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-SD377S
Sample No.:	PP07006
FCC ID No.:	ACLAP7G81
Operation frequency:	2450MHz
Output rating:	800W
Magnetron type:	2M210-M1
Employed mode:	Turntable
Door seal type:	Choke

2. Data summary

Item		Result
Input power measurement		Measured input power: 1225.2W
RF output power measurement		Measured RF output power: 603.63W
Frequency measurement	Frequency vs Line voltage variation test (96~150V/1000ml water load)	Maximum frequency variation Horizontal: 2461.5~2468.7MHz Vertical: 2461.4~2469.9MHz
	Frequency vs Load variation test (1000~200ml water load/ 120V)	Maximum frequency variation: Horizontal: 2461.7~2469.1MHz Vertical: 2461.0~2468.5MHz
Radiated emission test		See section 3.4
Safety check		Left side: 75.5 $\mu$ W/cm <sup>2</sup> Front side: 96.7 $\mu$ W/cm <sup>2</sup> Top side: 105.8 $\mu$ W/cm <sup>2</sup> Right side: 102.3 $\mu$ W/cm <sup>2</sup> Back side: 35.7 $\mu$ W/cm <sup>2</sup> Bottom side: 30.3 $\mu$ W/cm <sup>2</sup>
Conducted emission test		See section 3.6

3. Test data and results

3.1 Input power measurement

A beaker of 700ml 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-SD377S	120V/60Hz	10.21A	1225.2W

Test instrumentation

Name/Model	Number
Programmable AC Power Source CIF-5000FP	979824
Voltage Meter D26/1-V	容-019-28
Current Meter T19/1-A	容-019-30

Test photograph



### 3.2 RF output power measurement

A beaker of 1000ml 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.

Test	Temperature before test ( )	Temperature after test ( )	T ( )
1	10.7	28.1	17.4
2	10.8	28.1	17.3
3	11.0	28.2	17.2

Temp. Rise= (Temperature after test- Temperature before test)/3=17.3  
 RF output power=[(4.187 joules/Cal) x (Volume in ml) x (Temp. Rise)] / Time in seconds  
 =(4.187x1000x17.3)/120=603.63W

The measured output was found to be above 500W. Therefore, in accordance with section 18.305 of FCC part 18, the measured out-of-band emissions were compared to the  $25\sqrt{\text{power}/500}$  [μV/m] @ 300m limit.

#### Test instrumentation

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

### 3.3 Frequency measurement

Following the above test, a beaker of 1000ml 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 from 80 percent 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/1000ml water load)
NN-SD377S	Horizontal: 2461.5~2468.7MHz
	Vertical: 2461.4~2469.9MHz

#### 3.3.2 Frequency vs Lode variation test

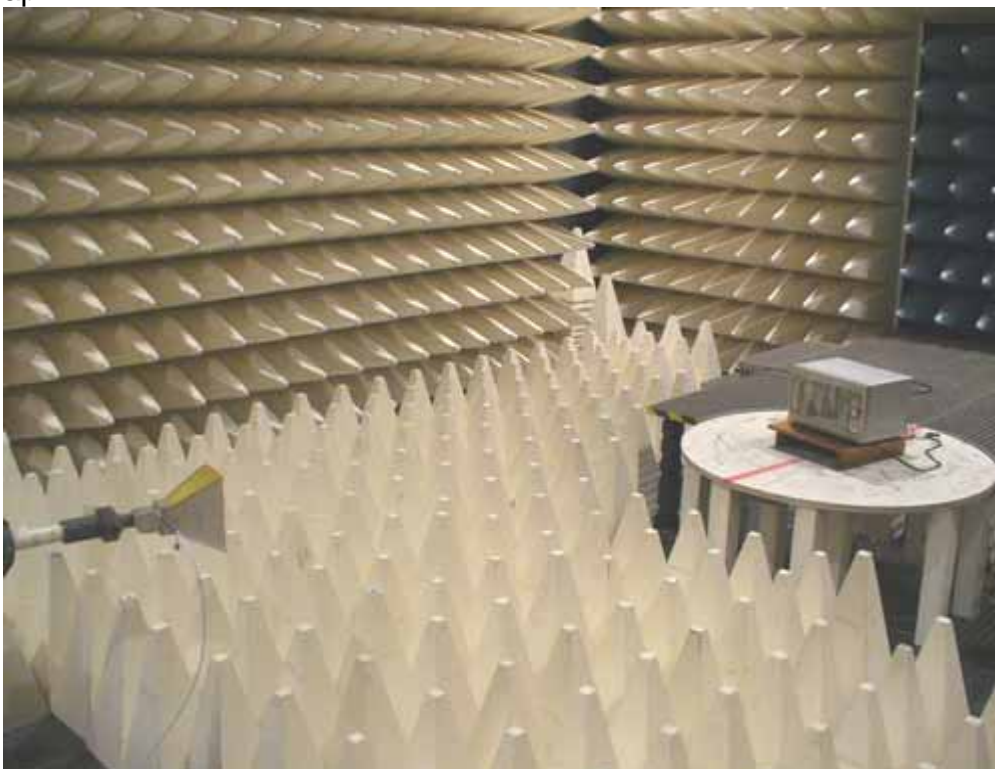
Initial load: 1000ml. Load at completion of test: 200ml.

Model Number	Maximum frequency variation (1000~200ml water load/ 120V)
NN-SD377S	Horizontal: 2461.7~2469.1MHz
	Vertical: 2461.0~2468.5MHz

Test instrumentation

Name/Model	Number
Double-Ridged Waveguide Horn Antenna HF 906	容-001-04
Spectrum Analyzer FSU	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 in the front right corner. The oven worked at maximum power.

The variable test condition	Antenna polarization: vertical & horizontal
	Water load position (in the center of the oven and in the front right corner)
	Turn table azimuth (0°~360°)
	Water load quantity (700ml &300ml)

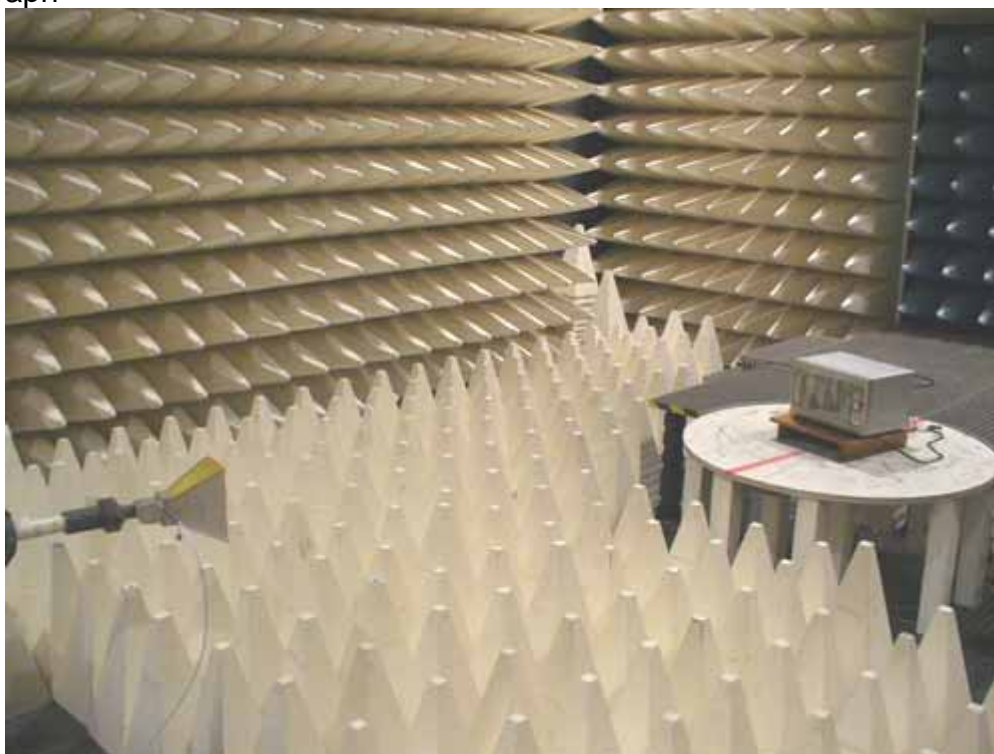
The test results is the maximized value as above test condition:

Comment	Test Frequency (MHz)	Result (dBuV/m)	Result @ 300m (dBuV/m)	Antenna Polarization	Limit @ 300m (dBuV/m)	Margin (dB)
Side band	2218.2	66.15	11.6527318	Vertical	35.66	24.0072682
Side band	2701.5	69.47	20.56675669	Vertical	35.66	15.09324331
2nd.Harmonic (700mlcentre)	4926.8	49.21	2.887353779	Vertical + Horizontal	35.66	32.77264622
2nd.Harmonic (700mlcorner)	4919.2	50.21	3.239664224	Vertical + Horizontal	35.66	32.42033578
2nd.Harmonic (300mlcentre)	4921.5	49.84	3.104559588	Vertical + Horizontal	35.66	32.55544041
2nd.Harmonic (300mlcorner)	4920.8	50.67	3.415859507	Vertical + Horizontal	35.66	32.24414049
Spurious	6493.2	54.19	5.122712703	Vertical	35.66	30.5372873
Spurious	6490.6	52.46	4.19758984	Horizontal	35.66	31.46241016
Spurious	7069.1	55.8	6.165950019	Vertical	35.66	29.49404998
Spurious	7073.4	56.67	6.815535747	Horizontal	35.66	28.84446425
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 (700mlcentre)	7361.8	60.2	10.23292992	Vertical + Horizontal	35.66	25.42707008
3nd.Harmonic (700mlcorner)	7356.2	61.7	12.16186001	Vertical + Horizontal	35.66	23.49813999
3nd.Harmonic (300mlcentre)	7352.1	55.31	5.827737748	Vertical + Horizontal	35.66	29.83226225
3nd.Harmonic (300mlcorner)	7353.4	54.98	5.61047976	Vertical + Horizontal	35.66	30.04952024
4th.Harmonic (700mlcentre)	9822.4	57.87	7.825282051	Vertical	35.66	27.83471795
4th.Harmonic (700mlcentre)	9834.4	54.93	5.578276021	Horizontal	35.66	30.08172398
5th.Harmonic (700mlcentre)	12280.8	57.36	7.379042301	Horizontal	35.66	28.2809577
5th.Harmonic (700mlcentre)	12291.3	56.73	6.862778784	Vertical	35.66	28.79722122

Test instrumentation

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

Test photograph



3.5 Safety check

A 275ml water load was placed in the center of the oven. The oven worked at maximum power.	
Safety check	Left side: $75.5\mu\text{W}/\text{cm}^2$ Front side: $96.7\mu\text{W}/\text{cm}^2$ Top side: $105.8\mu\text{W}/\text{cm}^2$ Right side: $102.3\mu\text{W}/\text{cm}^2$ Back side: $35.7\mu\text{W}/\text{cm}^2$ Bottom side: $30.3\mu\text{W}/\text{cm}^2$

Test instrumentation

Name/Model	Number
E-Filed Sensor AV3941E	0401001



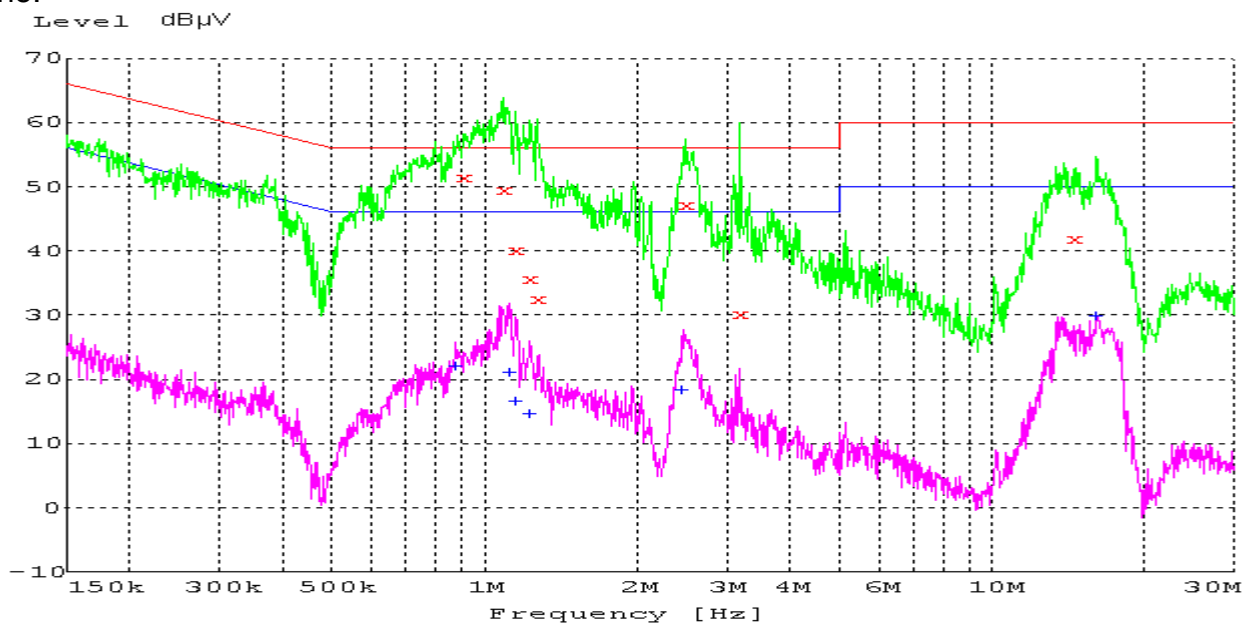
Test photograph



### 3.6 Conducted emission test

A beaker of 700ml water was placed in the center of the microwave oven. The microwave oven worked at maximum power.

“L” line:

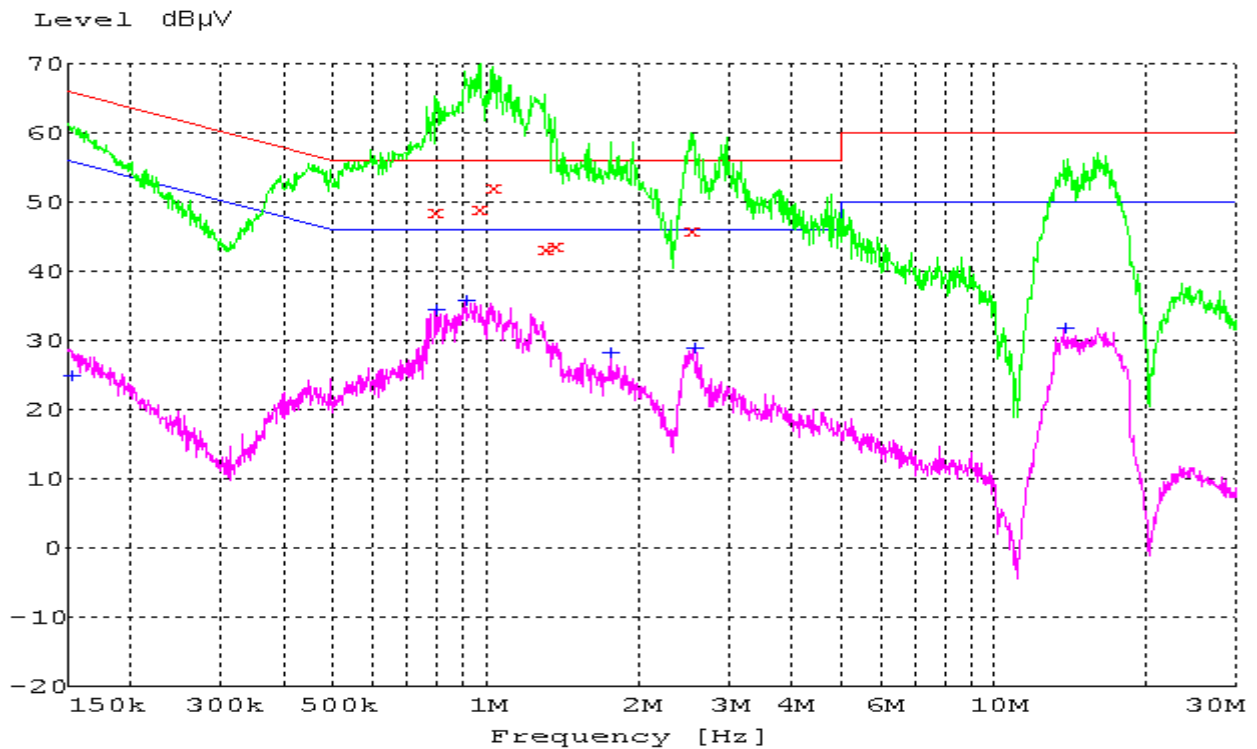


x	MES	C70110PA002L_fin	QP	
+	MES	C70110PA002L_fin	AV	
—	MES	C70110PA002L_pre	PK	
—	MES	C70110PA002L_pre	AV	
—	LIM	FCC 18	QP	2004
—	LIM	FCC 18	AV	2004
			Voltage	QP Limit
			Voltage	AV Limit

Frequency (MHz)	QP-Level (dBμV)	Limit (dBμV)	Margin (dB)
0.907800	51.50	56.00	4.50
1.086458	49.50	56.00	6.50
1.148907	40.20	56.00	15.80
1.229583	35.70	56.00	20.30
1.269485	32.50	56.00	23.50
2.502412	47.20	56.00	8.80
3.192385	30.20	56.00	25.80
14.494700	41.90	56.00	14.10

Frequency (MHz)	AV-Level (dBμV)	Limit (dBμV)	Margin (dB)
0.875775	21.90	46.00	24.10
1.117246	21.00	46.00	25.00
1.148907	16.50	46.00	29.50
1.229583	14.60	46.00	31.40
2.452959	18.20	46.00	27.80
16.079367	29.80	50.00	20.20

“N” line:



x x MES C70110PA002N\_fin QP  
 + + MES C70110PA002N\_fin AV  
 — MES C70110PA002N\_pre PK  
 — MES C70110PA002N\_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)
0.795762	48.60	56.00	7.40
0.971558	49.10	56.00	6.90
1.031513	52.30	56.00	3.70
1.300259	43.20	56.00	12.80
1.369519	43.80	56.00	12.20
2.532561	46.00	56.00	10.00

Frequency (MHz)	AV-Level (dBμV)	Limit (dBμV)	Margin (dB)
0.151202	24.80	55.90	31.10
0.795762	34.30	46.00	11.70
0.911443	35.70	46.00	10.30
1.754116	28.10	46.00	17.90
2.552862	28.90	46.00	17.10
13.706307	31.80	50.00	18.20

Test instrumentation

Name/Model	Number
EMI TEST RECEIVER ESCS 30	容-003-01
ARTIFICIAL MAINS NETWORK ESH3-Z5	容-003-19

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	/	/
Voltage Meter D26/1-V	容-019-28	200605-1-010039 2007.06.26	125-250-500V,50Hz consume ( VA ) :5/10/20; graduation: 125
Current Meter T19/1-A	容-019-30	200605-1-010036 2007.06.20	0 - 100A; graduation: 100
Weatherglass 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 FSU	容-001-33	2007.11.09	9kHz - 8 GHz, Sweep time:20ms,MAX.input level:+30dBm,Frequency counter function with a resolution:1Hz / ± 1%
E-Filed Sensor AV3941E	0401001	/	/
EMI TEST RECEIVER ESCS 30	容-003-01	200605-1-020640 2007.05.18	9 kHz—2750 MHz ,- 38—+ 137 dBμV / 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

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.