

REPORT OF MEASUREMENTS (MICROWAVE OVEN TEST DATA)

FCC ID : AEZM218 MODEL : EM-P410WK DATE : September 13, 1999
 NOMINAL FREQUENCY : 2,450 MHz TESTED BY : K. HARADA
K. Harada

DESCRIPTION : (Unit Dimension : cm)

Cabinet Dimension : 52.5 by 41.8 by 28.9 Door Dimension : 41.4 by 25.1

Oven Cavity Dimension : 35.1 by 37.1 by 21.3 Door Viewing area : 30.5 by 14.5

Feed Type and Location : Waveguide, located right side Stirrer : Rotating tray

(incl. Rotating tray)

Door seal Type : Choke Seal Magnetron Type : Sanyo 2M253H

Others : N/A

TEST EQUIPMENT USED :

1. Antenna (Horn Antenna)

	<u>Frequency Range</u>	<u>Correction Factor</u>
AILTECH 91888-2	1.0 - 2.0 G Hz	21.5 - 22 dB
AILTECH 91889-2	2.0 - 3.6 G Hz	20.5 - 21 dB
AILTECH 94613-1	3.6 - 7.6 G Hz	37 dB
AILTECH 91891-2	7.3 - 10.0 G Hz	39.8 dB

Other Correction Factor

(a) Cable loss

<u>Frequency (M Hz)</u>	<u>Cable loss (dB)</u>
2.400	1.1
2.500	1.1
4.900	1.6
7.350	2.2
9.800	2.7

(b) Loss of Band Rejection Filter

<u>Frequency Range (G Hz)</u>	<u>Filter loss (dB)</u>
2.0 - 3.6	3.0

2. Field Strength Meter

AILTECH NM-67 (SER 0241-03088)

Last calibrated date : November 20, 1998

Setting : Bandwidth ----- 1 MHz

Function ----- Field Intensity (average value detector)

3. When measuring sidebands close to the fundamental, band reject filter Model 6N45-2450/60 (SER FK837-1) was employed.

Designated by Ministry of International Trade and Industry

Attachment #1C

KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER

HEAD OFFICE
6-8-7, NISHITEMMA
KITA-KU, OSAKA, 530 JAPAN

KEC

IKOMA
TESTING LABORATORY
10630, TAKAYAMA-CHO
IKOMA-CITY, NARA, 630-01 JAPAN

*Corporate Juridical Person***ENGINEERING TEST REPORT****REPORT NO. A-033-99-C****Issued Date : September 22, 1999**

This test report is to certify that the tested device properly complies with the requirements of:

FCC Rules and Regulations Part 18 Subpart C.

One of the tests necessary to show compliance to the requirements was performed and this result met the specifications of requirement. The results of this report should not be construed to imply compliance of equipment other than that which was tested. Unless the laboratory permission, this report should not be copied in part.

1. Applicant

Company Name : SANYO Electric Co., Ltd. Home Appliance Company Laundry and cooking Appliances Division

Mailing Address : 1-1, Seta, 1-chome, Otsu City, Shiga, 520-2198 Japan

2. Identification of Tested Device

FCC ID : AEZM218
Device Name : Microwave Oven
Trade Name : SANYO
Model Number : EM-P410WK
Serial Number : prototype No.1
Date of Manufacture : September, 1999

3. Test Items and Procedure

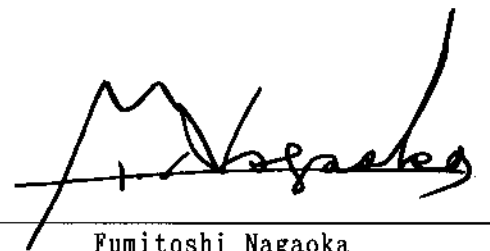
1) Radiated Emission Measurement (30 MHz to 1000 MHz)

Above tests was performed under : FCC/OET MP-5 (1985)

4. Date of Test

Receipt of Test Sample : September 16, 1999
Test Completed on : September 17, 1999

CERTIFIED BY :



Fumitoshi Nagaoka
Associate Director of Ikoma Testing Laboratory

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ENGINEERING TEST REPORT

1. GENERAL INFORMATION

1.1 Product Description

The SANYO Model No. EM-P410WK(referred to as the EUT in this engineering test report) is a Household Microwave Oven.

1) Special Feature

- Magnetron Frequency : 2450 MHz \pm 50 MHz
- RF Power : 1000 W

2) Rated Power Supply

- AC 120 V, 60 Hz
- Protection Class 1(with ground connector)

3) Contained Oscillator

- 4.0 \pm 0.4 MHz(Main PCB)

1.2 Description for Equipment Authorization

1) Rules Part(s) under which equipment operated

FCC Rule Part 18, Subpart C
ISM Equipment

2) Kind of Equipment Authorization

(x) Certification () Verification

3) Procedure of Application

(x) Original Equipment () Modification

1.3 Test Facility

N a m e : KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER(KEC)
IKOMA TESTING LABORATORY
Open Test Site No.2

Address : 12128, Takayama-cho Ikoma-city, Nara, 630-0101 Japan

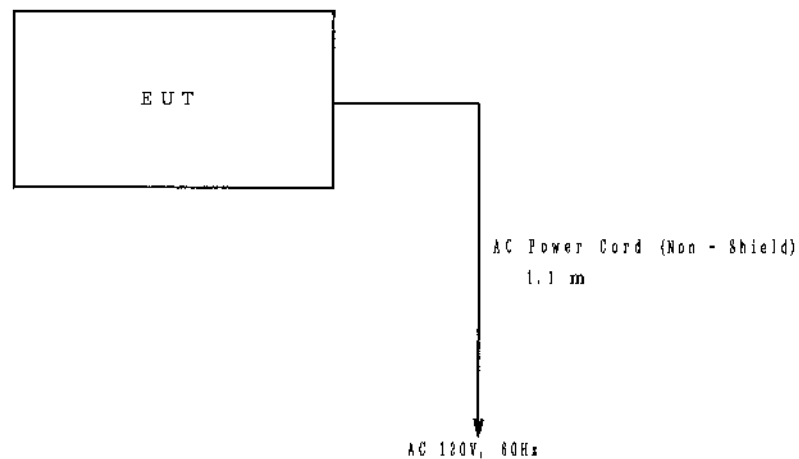
These test facilities have been filed with the FCC under the criteria of ANSI C63.4-1992

ENGINEERING TEST REPORT**2. TESTED SYSTEM****2.1 Test Mode**

The compliance tests were performed under following operation mode.

Maximum Output Power Operation**2.2 Operaton of EUT System**

- 1) Open the door of EUT.
- 2) Set the load as follows in EUT.
 - Receptacle
 - 1000 cc volume Beaker
 - Load for the test
 - 700 cc water with beaker
- 3) Close the door of EUT.
- 4) Set the output power to maximum.
- 5) Set the cooking time.
- 6) Push the start pad.
Then start the cooking.

2.3 Block Diagram of EUT System

ENGINEERING TEST REPORT**3. MEASUREMENT OF ELECTRIC FIELD STRENGTH (30 MHz TO 1000 MHz)****3.1 Reference Rule and Specification**

FCC Rule Part 18 Subpart C
FCC/OET MP-5(1985)

3.2 Test Procedure

1) Configure the EUT.

[See 3.3 Test arrangement and 3.4 Photographs of EUT System Configuration]

[Note]

The power cords for the EUT are connected through the receptacle with the turn floor to the CVCF placed under the ground plane.

2) Operate the EUT.

3) To determine the emissions of the EUT, preliminary radiated measurement was performed at a closer distance than that specified for final radiated measurement using the broad band antenna and the spectrum analyzer.

4) To search the frequency of maximum emission level on the spectrum analyzer, change the EUT System configuration, move the signal cables and the power cords, change the EUT conditions.

5) The spectrum was scanned from 30 MHz to 1000 MHz and collect the emissions on the spectrum analyzer.

6) The collected emissions for final test were measured at the specified distance using the tuned dipole antenna or broad band antenna and the test receiver *1).

[Note]

*1) Test Receiver Operation Mode

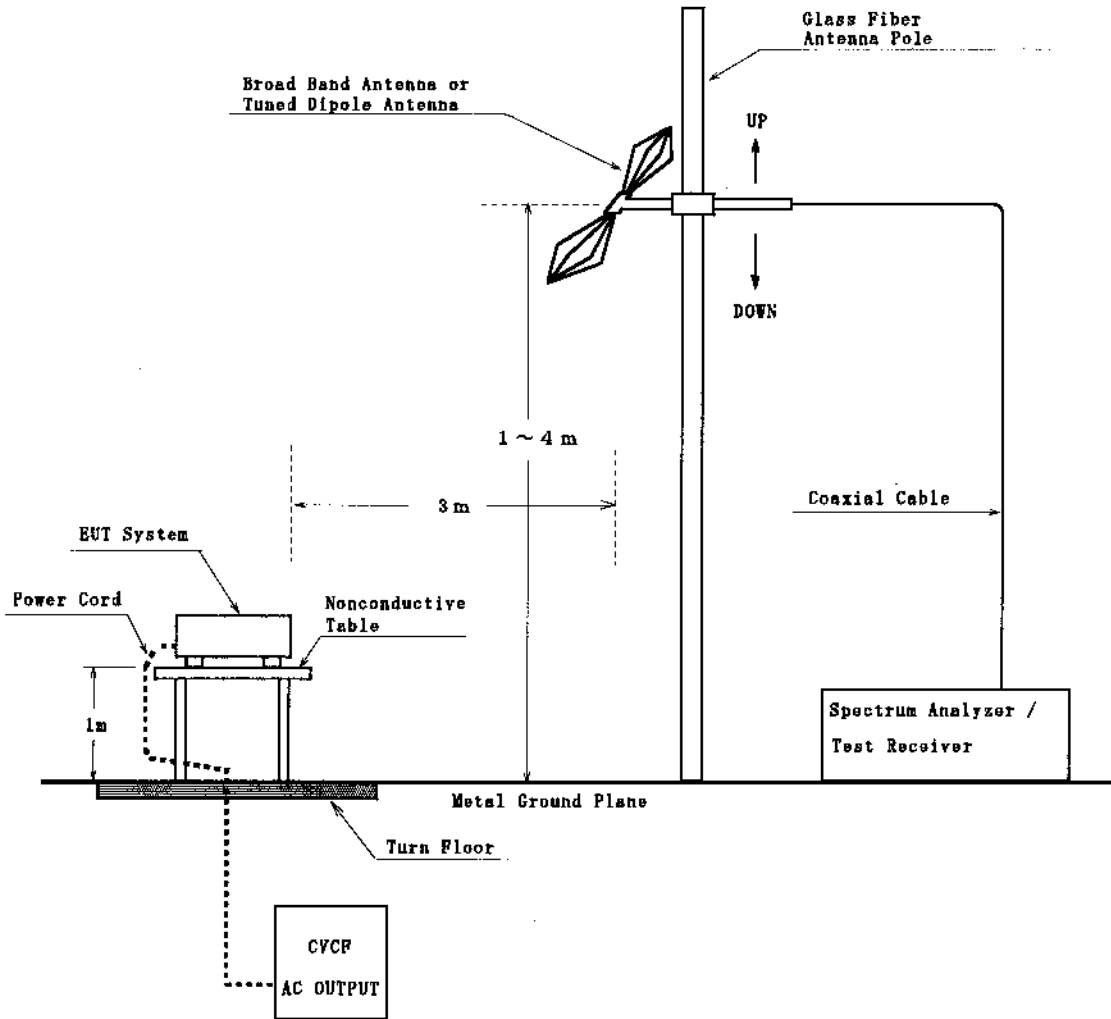
Detector Function : Average

IF Band Width : 120 kHz(frequency range in 30 MHz - 1000 MHz)

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3.3 Test Arrangement

[Open Site]



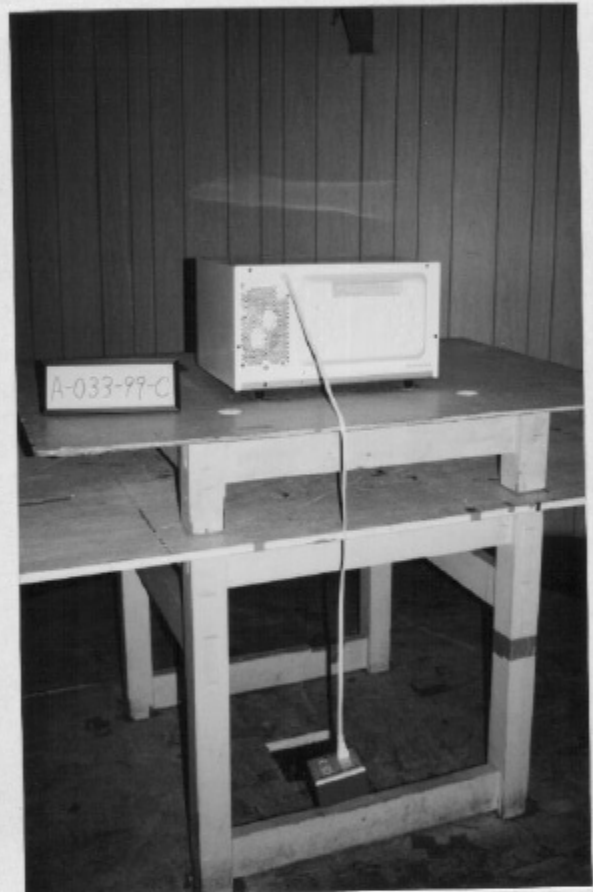
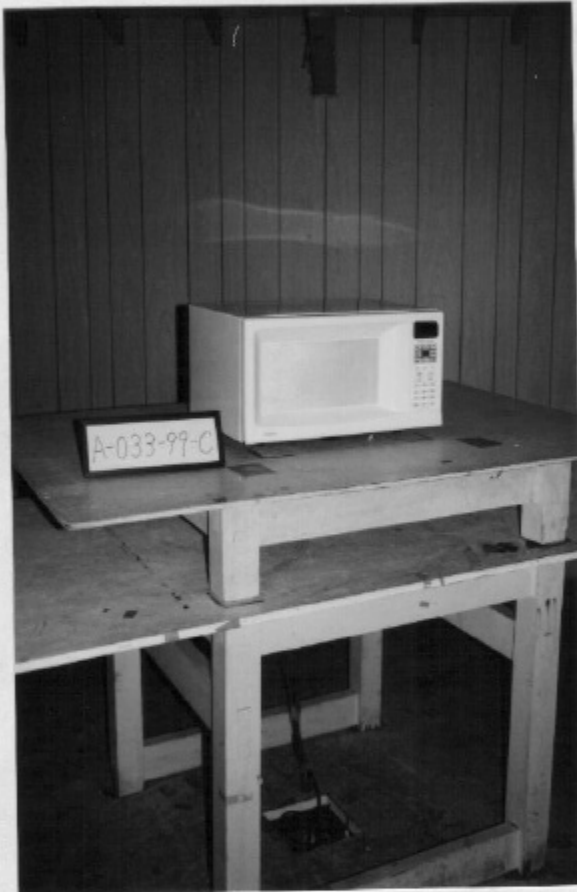
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Attachment #1C

3.4 Photographs of EUT System Configuration

front view

rear view



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3.5 Test Results

Emission Frequency [MHz]	Antenna Factor [dB]	Meter Reading at 3 m [dB μ V]		Maximum Field Strength at 300 m [μ V/m]	Limits [μ V/m]
		Horiz.	Vert.		
49.4	11.9	<-9.0	<-9.0	<0.1	35.4
56.1	10.5	-6.0	-4.0	<0.1	35.4
85.6	9.1	-3.0	-2.0	<0.1	35.4
91.6	10.2	-8.0	-8.0	<0.1	35.4
309.0	17.8	<-10.0	<-10.0	<0.1	35.4
508.0	22.7	<-9.0	<-9.0	<0.1	35.4
700.0	25.9	<-9.0	<-9.0	<0.1	35.4

[Note]

Distance Corr. Factor : -40 dB(from 3 m to 300 m)
 Antenna Factor : Antenna Factor includes the cable loss
 Test Condition : 700 ml water load, at the center of tray.
 Limits : $25\sqrt{P/500} = 25\sqrt{1000/500} = 35.4[\mu V/m]$
 P[W] : RF(Microwave) Power

[Environment]

Temperature : 26 °C Humidity : 68 %

[Sample Calculation]

Frequency 49.40 MHz, Horizontal Polarization
 Field Strength (μ V/m at 300 m)
 $= 10^{(Meter Reading [dB\mu V] + Antenna Factor [dB] + Distance Corr.Factor [dB])/20}$
 $= 10^{(-9.0 + 11.9 - 40)/20}$
 $= 10^{(-37.1/20)}$
 $= <0.1 [\mu V/m]$

[Summary of Test Result]

Minimum margin was more than 51.4 dB.

Tested Date : September 17, 1999

Signature

Y. Kawai
 Yasunari Kawai

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3.6 List of Test Instruments

Instrument	Manufacturer	Model No	Specifications	KEC Control No.	if used, checked by "X".	Last Cal.	Next Cal.
Test Receiver	Rohde & Schwarz	ESVP	Frequency Range 20 MHz - 1000 MHz	FS-48-3	<input type="checkbox"/>	1999/5	2000/5
		ESV	Frequency Range 20 MHz - 1000 MHz	FS-55	<input checked="" type="checkbox"/>	1999/4	2000/4
Spectrum Analyzer	Advantest	TR4172	Frequency Range 50 Hz - 1.8 GHz	FS-44-2	<input checked="" type="checkbox"/>	1998/9	1999/9
Pre-Selector	Advantest	TR14037	Frequency Range 10 kHz - 1.0 GHz	FS-44-3	<input checked="" type="checkbox"/>	1998/9	1999/9
Biconical Antenna	Schwarzbeck	BBA9106	Frequency Range 30 MHz - 300 MHz	AN-80	<input checked="" type="checkbox"/>	1999/2	2000/2
Log-Periodic Antenna	Schwarzbeck	UHALP 9107	Frequency Range 300 MHz - 1 GHz	AN-97	<input checked="" type="checkbox"/>	1999/2	2000/2
Tuned Dipole Antenna	Kyoritsu	KBA-511S	Frequency Range 25 MHz - 500 MHz	AN-112	<input type="checkbox"/>	1999/3	2000/3
		KBA-611S	Frequency Range 500 MHz - 1 GHz	AN-7-11	<input type="checkbox"/>	1999/3	2000/3

REPORT OF MEASUREMENT (MICROWAVE OVEN TEST DATA SHEET B)

FCC ID: AEZM218 MODEL: EM-P410WK DATE: September 13, 1999
 Nominal Frequency: 2,450 MHz TESTED BY: K. KHARADA
K. Almeida

DATA SUMMERY (FCC MEASUREMENT PROCEDURE MP-5)

SAFETY CHECK (at 5 cm) Load: 275 ml/center CALCULATION: $E(300m) = K * 10^{((A+B+C+D+E)/20)}$
 FUNDAMENTAL Load: 1,000 ml/center

0.09 mW/sq.cm
2,469 MHz

LIMIT = $25 * \sqrt{(power/500)}$ 35.4 $\mu V/m$

* Note: Location of load for the oven provided with the rotating tray is:
 Contiguous with the shelf circumference.

RADIATION FIELD STRENGTH ($\mu V/m$ at 300 m)

	Load (ml)	Location of Load	Emission Frequency (MHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Filter Loss (dB)	Calcu. Factor (dB)	The Value of K ($E(300m) = K * E(3m)$)	Max. Field Strength ($\mu V/m$ at 300m)	Limit ($\mu V/m$ at 300m)
2nd Harmonic	300	Center	4,930	18.0	37.0	1.6	-	5	0.0100	12.0	35.4
2nd Harmonic	300	* Right/Front Corner	4,930	16.0	37.0	1.6	-	5	0.0100	9.5	35.4
2nd Harmonic	700	Center	4,932	14.0	37.0	1.6	-	5	0.0100	7.6	35.4
2nd Harmonic	700	* Right/Front Corner	4,932	14.0	37.0	1.6	-	5	0.0100	7.6	35.4
3rd Harmonic	300	Center	7,398	15.0	39.8	2.2	-	5	0.0100	12.6	35.4
3rd Harmonic	300	* Right/Front Corner	7,398	15.0	39.8	2.2	-	5	0.0100	12.6	35.4
3rd Harmonic	700	Center	7,342	14.0	39.8	2.2	-	5	0.0100	11.2	35.4
3rd Harmonic	700	* Right/Front Corner	7,342	14.0	39.8	2.2	-	5	0.0100	11.2	35.4
4th Harmonic	700	Center	9,184	14.5	39.8	2.7	-	5	0.0100	12.6	35.4
Spurious	700	Center	2,373	31.0	20.8	1.1	3	5	0.0060	6.7	35.4
Emission Sideband 2,400 MHz	700	Center	2,400	28.0	20.8	1.1	3	5	0.0061	4.8	35.4
Emission Sideband 2,500 MHz	700	Center	2,500	15.0	20.8	1.1	3	5	0.0064	1.1	35.4

Maximum Frequency Variation 1,000 ml load 2,469 to 2,469 M Hz.
 Total Power Input to Oven 1,480 Watts
 Power Development in dummy load (Thermal Method) 1,000 Watts (IEC705 Test Procedure)
 Supply Voltage AC 120 V 60 Hz

1830 MHz - 2745 MHz $2.6230 * 10^{(-3)}$ * frequency : GHz -0.0002
 2745 MHz - 3660 MHz $2.1858 * 10^{(-3)}$ * frequency : GHz +0.0010
 3660 MHz - 4575 MHz $1.0929 * 10^{(-3)}$ * frequency : GHz +0.0050
 4575 MHz and above 0.0100

FCC ID : AEZM218 MODEL : EM-P410WK DATE : September 13, 1999

TESTED BY : K. HARADA
K. Harada

Note : In order to convert the measured field strength at 3 meters to the field at 300 meters, comply with FCC/OST MP-5 Appendix C "4.6.1 Computations to determine compliance". A calculation factor of 5 dB, this figure is fixed by SANYO, is introduced before adjusting a tolerance in measurement.

A calculation factor of 5 dB should be added to "METER READING" as shown in SAMPLE CALCULATION below.

SAMPLE CALUCULATION

(1) 2nd Harmonic with 300 m/Center load

$$\begin{aligned}\text{Field Strength at 300 m} &= 0.0100 \times 10^{(1.80+37+1.6+5) \div 20} \\ &= 12.0 \text{ uV/m}\end{aligned}$$

(2) Emission sideband 2,400 M Hz., 700 m/Center load

$$\begin{aligned}\text{Field Strength at 300 m} &= 0.0061 \times 10^{(28.0+20.8+1.1+3+5) \div 20} \\ &= 4.8 \text{ uV/m}\end{aligned}$$

REPORT OF MEASUREMENT (MICROWAVE OVEN TEST DATA)
 - Measurement of Frequency VS Line Voltage Stability -

FCC ID : AEZM218 Model : EM-P410WK Date : Sep 13,1999
 Nominal Frequency : 2,450 MHz Tested by : K.HARADA
k.harada

Line Voltage Variation [Volt]	Frequency [GHz]	Deviation for ISM Frequency [MHz]	Limit [MHz]
96 (- 20%)	2.469	+19	± 50
120 (± 0%)	2.469	+19	± 50
150 (+ 25%)	2.468	+18	± 50

[Environment]

Temperature : 26.0 °C
 Humidity : 62.0 %

[Sample Calculation]

Frequency : 2.469 GHz

Deviation for ISM Frequencies Calculated as follows,

$$\underline{2.469} - 2.4500 = \underline{+0.019} \text{ [GHz]} = \underline{+19.0} \text{ [MHz]}$$

[Summary of Test Results]

Above data shows that the test device do / do not complies with the requirements.