



Report No. MO-069

Date : June 8, 1999

ENGINEERING TEST REPORT

1. Name of Manufacturer : SANYO Industries (Singapore) Pte., Ltd.  
117/119, Neythal Road,  
Singapore 628604
2. Description of Equipment : Microwave Oven
  - a. FCC ID : AEZM510
  - b. Model No. : 565.60502990
  - c. Rated Power Supply : AC Single Phase 120V, 60Hz
  - d. Rated Power Consumption : 1,580 Watts
  - e. Operating Frequency : 2,450 MHz
  - f. RF (Microwave) Power : 1,100 Watts
  - g. Magnetron : 2M-247H
3. Intended Use : Household Cooking Appliance
4. Measurement Procedure Used : FCC Rules Part 18,  
Subpart B and C
5. Date of Measurement : May 31, 1999  
June 2, 1999

I hereby certify that the tests reported herein were conducted in accordance with the method of measurement described in FCC Rules Part 18, Subpart B and C.

  
**Morito Yamada, Manager**

SANYO Electric Co., Ltd., Home appliances Company  
Laundry & Cooking Appliances Division  
Third Engineering Department  
(Phone +81-77-543-5605 Fax +81-77-545-3583)



Issued : June 8, 1999

## 18.207 TECHNICAL REPORT

### (a) DESCRIPTION OF THE MEASUREMENT FACILITIES

- (1) SANYO Electric Co., Ltd. Shiga Measurement Station  
..... Refer to Report No. FO-86-1 (February 1, 1986)
- (2) Kansai Electric Industry Development Center (KEC),  
Ikoma Testing Laboratory, Open Test Site No. 2  
..... Refer to Attachment #1C in this Test Report.

### (a) A COPY OF THE INSTALLATION AND OPERATING INSTRUCTIONS

See Attachment #4.

### (b) THE FULL NAME AND MAILING ADDRESS OF THE MANUFACTURER FOR THE EQUIPMENT AUTHORIZATION

Mr. James Roach  
SANYO Sales & Supply (U.S.A.) Corp.  
Suite 300, N. Arlington Heights Road,  
Itasca, Illinois 60143, U.S.A.

### (c) THE FCC IDENTIFIER, MODEL NUMBER(S)

FCC ID : **AEZM510**  
MODEL NO(S) : 565.60502990

### (d) STATEMENT OF THE RATED TECHNICAL PARAMETERS

- (1) Circuit Diagram : See Attachment #3
- (2) Nominal Operating Frequency : 2,450 MHz
- (3) Maximum RF Energy Generated : 1,100 Watts
- (4) Electrical Power Requirements of Equipment : 1,580 Watts
- (5) Any Other Pertinent Operating Characteristics : None.

### (e) REPORT OF MEASUREMENTS

See Attachment #1, #1A, #1B, #1C and #1D

## REPORT OF MEASUREMENTS (MICROWAVE OVEN TEST DATA)

FCC ID : AEZM510 MODEL : 565.60502990 DATE : May 31, 1999NOMINAL FREQUENCY : 2.450 MHz TESTED BY : H.HAYASHI*H. Hayashi*

DESCRIPTION : (Unit Dimension : cm)

Cabinet Dimension : 59.5 by 46.0 by 36.2 Door Dimension : 48.7 by 32.5Oven Cavity Dimension : 43.1 by 42.5 by 30.2 Door Viewing area : 37.6 by 21.3Feed Type and Location : Waveguide, located right side Stirrer : Rotating tray /stirrer  
(incl. Rotating tray)Door seal Type : Choke Seal Magnetron Type : Sanyo, 2M-247HOthers : 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.

REPORT OF MEASUREMENT (MICROWAVE OVEN TEST DATA SHEET B)

FCC ID : AEZM510 MODEL : 565.60502990 DATE : May 31, 1999  
 Nominal Frequency : 2,450 MHz TESTED BY : H.HAYASHI  
H. Hayashi

DATA SUMMERY (FCC MEASUREMENT PROCEDURE MP-5)

CALCULATION :  $E < 300m > = K * 10^{((A+B+C+D+E)/20)}$

SAFETY CHECK (at 5 cm) Load : 275 ml/center 0.17 mW/sq.cm  
 FUNDAMENTAL Load : 1,000 ml/center 2,450 MHz

LIMIT =  $25 * \sqrt{\text{power}/500}$  : 37.1  $\mu\text{V}/\text{m}$

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

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

Load	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 ( $\mu\text{V}/\text{m}$ at 300m)	Limit ( $\mu\text{V}/\text{m}$ at 300m)
300	Center	4,898	20.0	37.0	1.6	—	5	0.0100	15.1	37.1
300	* Right/Front Corner	4,895	20.0	37.0	1.6	—	5	0.0100	15.1	37.1
700	Center	4,902	17.0	37.0	1.6	—	5	0.0100	10.7	37.1
700	* Right/Front Corner	4,893	17.0	37.0	1.6	—	5	0.0100	10.7	37.1
300	Center	7,351	22.0	39.8	2.2	—	5	0.0100	28.2	37.1
300	* Right/Front Corner	7,347	23.0	39.8	2.2	—	5	0.0100	31.6	37.1
700	Center	7,350	24.0	39.8	2.2	—	5	0.0100	35.5	37.1
700	* Right/Front Corner	7,352	20.0	39.8	2.2	—	5	0.0100	22.4	37.1
700	Center	9,830	14.0	39.8	2.7	—	5	0.0100	11.9	37.1
700	Center	2,308	28.0	20.8	1.1	3	5	0.0059	4.6	37.1
Emission Sideband 2,400 MHz	Center	2,400	16.0	20.8	1.1	3	5	0.0061	1.2	37.1
Emission Sideband 2,500 MHz	Center	2,500	16.0	20.8	1.1	3	5	0.0064	1.3	37.1

Maximum Frequency Variation 1,000 ml load 2,453 to 2,455 MHz.  
 Total Power Input to Oven 1,580 Watts  
 Power Development in dummy load (Thermal Method) 1,100 Watts (IEC705 Test Procedure)  
 Supply Voltage AC 120 V 60 Hz

1830 MHz - 2745 MHz  
 2745 MHz - 3660 MHz  
 3660 MHz - 4575 MHz  
 4575 MHz and above

$2.6230 * 10^{(-3)}$  \* frequency : GHz) -0.0002  
 $2.1858 * 10^{(-3)}$  \* frequency : GHz) +0.0010  
 $1.0929 * 10^{(-3)}$  \* frequency : GHz) +0.0050  
 0.0100

FCC ID : AEZM510 MODEL : 565.60502990 DATE : May 31,1999  
 TESTED BY : H.HAYASHI  
*H. Hayashi*

Note : In order to convert the measured field strength at 3meters 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 bfor 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) 2<sup>nd</sup> Harmonic with 300 ml/Center load

$$\begin{aligned} \text{Field Strength at 300 m} &= 0.0095 \times 10^{(20.0 + 37 + 1.6 + 5) \div 20} \\ &= 15.1 \text{ uV/m} \end{aligned}$$

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

$$\begin{aligned} \text{Field Strength at 300 m} &= 0.0061 \times 10^{(16.0 + 20.8 + 1.1 + 3 + 5) \div 20} \\ &= 1.2 \text{ uV/m} \end{aligned}$$

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



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

*Corporate Juridical Person***ENGINEERING TEST REPORT****REPORT NO. A-018-99-C**

Issued Date : June 4, 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 : AEZM510  
Device Name : Microwave Oven  
Trade Name : SANYO  
Model Number : 565.60502990  
Serial Number : prototype No.1  
Date of Manufacture : May, 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 : May 28, 1999  
Test Completed on : June 2, 1999

CERTIFIED BY :

Eizo Hariya  
General Manager of Ikoma Testing Laboratory

**ENGINEERING TEST REPORT**

Attachment #1C

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**ENGINEERING TEST REPORT**

Attachment #1C

**1. GENERAL INFORMATION****1.1 Product Description**

The SANYO Model No. 565.60502990(referred to as the EUT in this engineering test report) is a Household Microwave Oven that installed countertop or built-in.

**1) Special Feature**

- Magnetron Frequency : 2450 MHz  $\pm$ 50 MHz
- RF Power : 1100 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**

Certification      ( ) Verification

**3) Procedure of Application**

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**

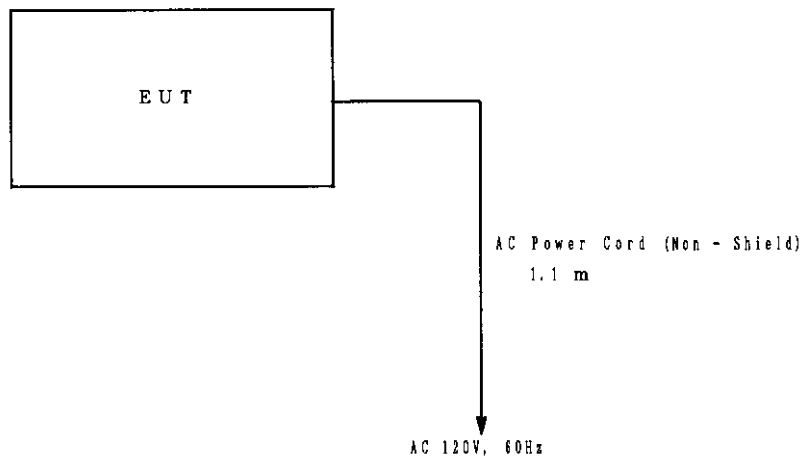
Attachment #1C

**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**

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**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]**

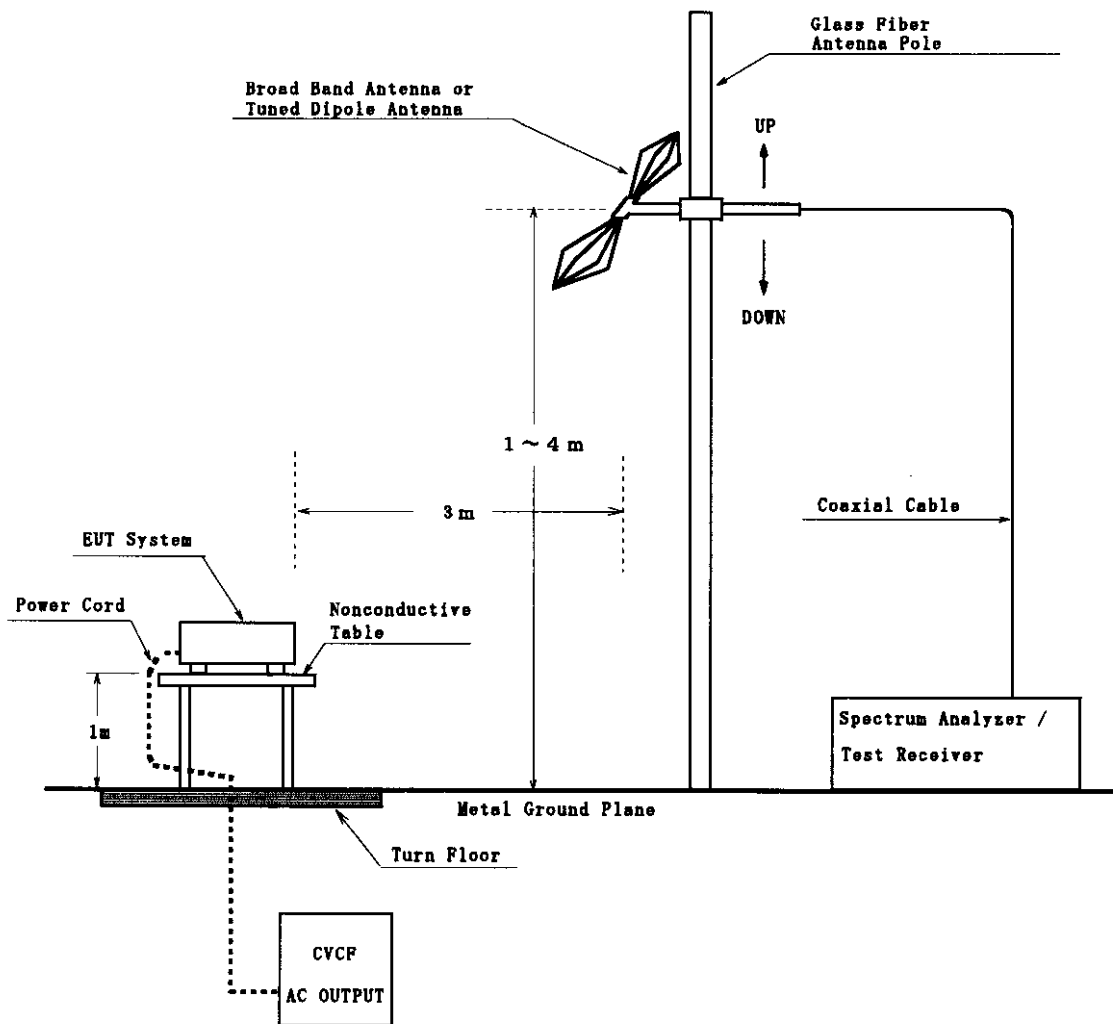
- \*1) Test Receiver Operation Mode  
Detector Function : Average  
IF Band Width : 120 kHz(frequency range in 30 MHz - 1000 MHz)

## ENGINEERING TEST REPORT

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### 3.3 Test Arrangement

[ Open Site ]



## ENGINEERING TEST REPORT

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## 3.5 Test Results

Emission Frequency [MHz]	Antenna Factor [dB]	Meter Reading at 3 m [dB $\mu$ V]		Maximum Field Strength at 300 m [ $\mu$ V/m]	Limits [ $\mu$ V/m]
		Horiz.	Vert.		
48.80	12.0	<-6.0	<-7.0	<0.1	37.1
51.70	11.4	<-6.0	<-7.0	<0.1	37.1
80.80	8.2	<-5.0	<-6.0	<0.1	37.1
107.80	13.1	<-4.0	<-6.0	<0.1	37.1
389.00	19.8	<-8.0	<-8.0	<0.1	37.1
730.00	26.5	<-7.0	<-7.0	<0.1	37.1

## [ 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 :  $25\sqrt{P/500} = 25\sqrt{1100/500} = 37.1$  [ $\mu$ V/m]  
 P[W] : RF(Microwave) Power

## [ Environment ]

Temperature : 22 °C Humidity : 52 %

## [ Sample Calculation ]

Frequency 48.80 MHz, Horizontal Polarization  
 Field Strength ( $\mu$ V/m at 300 m)  
 $= 10^{(Meter Reading [dB\mu V] + Antenna Factor [dB] + Distance Corr.Factor [dB])/20}$   
 $= 10^{(-6.0 + 12.0 - 40)/20}$   
 $= 10^{(-36.0/20)}$   
 $= <0.1$  [ $\mu$ V/m]

## [ Summary of Test Result ]

Minimum margin was more than 51.4 dB.

Tested Date : June 2, 1999

Signature Y. Kawai  
 Yasunari Kawai

## ENGINEERING TEST REPORT

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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)  
 - Measurement of Frequency VS Line Voltage Stability -

FCC ID : AEZM510 Model : 565.60502990 Date : May 31, 1999  
 Nominal Frequency : 2.450 MHz Tested by : H.HAYASHI

*H. Hayashi*

Line Voltage Variation [Volt]	Frequency [GHz]	Deviation for ISM Frequency [MHz]	Limit [MHz]
96 (- 20%)	2.454	+4	± 50
120 (± 0%)	2.453	+3	± 50
150 (+ 25%)	2.452	+2	± 50

[ Environment ]

Temperature : 24.4 °C

Humidity : 68.0 %

[ Sample Calculation ]

Frequency : 2.454 GHz

Deviation for ISM Frequencies Calculated as follows,

$$\underline{2.4540} - 2.4500 = \underline{+0.0040} \text{ [GHz]} = \underline{+4.0} \text{ [MHz]}$$

[ Summary of Test Results ]

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