



**FCC CFR47 PART 18 SUBPART C
ISM EQUIPMENT**

TEST REPORT

FOR

950W MICROWAVE OVEN

MODEL: MC7698W

FCC ID: A3LMC769

REPORT NUMBER: 00U0298-1

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Prepared for

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LAB CODE:200065-0

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1. VERIFICATION OF COMPLIANCE

COMPANY NAME : SAMSUNG ELECTRONICS CO., LTD
85 WEST TASMAN DRIVE
SAN JOSE, CA 95134

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TELEPHONE NO : (408) 828-8833

EUT DESCRIPTION: 950W MICROWAVE OVEN

MODEL NO/NAME : MC7698W

DATE TESTED : JUNE 16, 2000

TYPE OF EQUIPMENT:	CONSUMER ISM EQUIPMENT
TECHNICAL LIMIT:	SUBPART C
FCC RULES:	PART 18
MEASUREMENT PROCEDURE	FCC MP-5/1986
EQUIPMENT AUTHORIZATION PROCEDURE	CERTIFICATION
MODIFICATIONS MADE ON EUT	☐ YES ☒ NO

The above equipment was tested by Compliance Certification Services for compliance with the requirements set forth in the FCC CFR 47, PART 18. The said equipment in the configuration described herein shows that maximum emission levels emanating from the equipment are within the compliance requirements.

Warning : This report documents conditions under which testing was conducted and the results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Approved By

TOM N. COKENAS / DIRECTOR OF ENGINEERING
COMPLIANCE CERTIFICATION SERVICES

2. PRODUCT DESCRIPTION

The equipment under test is a microwave oven sold for consumer use. Model: MC7698W is a 950W microwave oven with digital controls.

3. TEST FACILITY

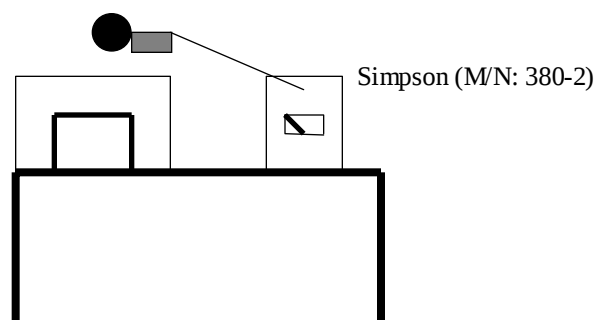
The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

4. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code:200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT(1300F2))

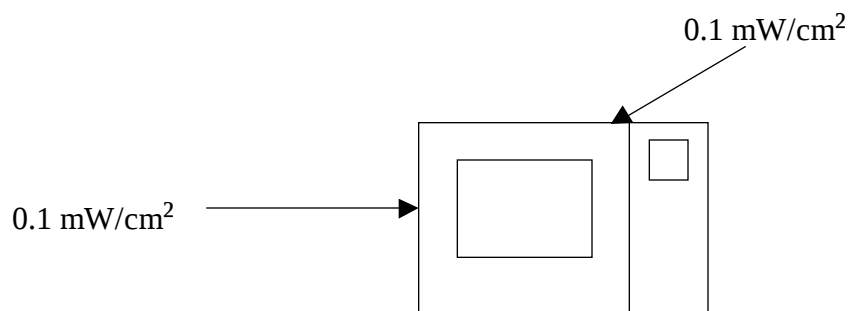
5. RADIO NOISE EMISSION MEASUREMENTS PROCEDURES/RESULTS

5.1 RADIATION HAZARD MEASUREMENT



Radiation Hazard Measurements

A 700-ml water load was placed in the center of the oven. The power setting was set to maximum power. While the oven was operating, the Simpson probe was moved slowly around the door seams to check for leakage.

**Fig.1**

LOCATION	MAXIMUM LEAKAGE (mW/cm ²)	LIMIT (mW/cm ²)
Fig.1 shows the locations of maximum leakage	0.1	1.0
All others	0.05	1.0

5.2 INPUT POWER

Input power and current were measured using a wattmeter and an ammeter. A 700 ml water load was placed in the center of the oven and the oven was set to maximum power. A 700 ml water load was chosen for its compatibility. Manufacturers to determine their input ratings commonly use this procedure.

	Input Voltage (Vac)	Input Current (amps)	Measured Input power (watts)
1450W:	120	12.92	1441

Based on the measured input power, the EUT was found to be operating within the intended specifications.

5.3 RF OUTPUT POWER MEASUREMENT

The Caloric Method was used to determine maximum output power. The initial temperature of a 1000-ml water load was measured.

The water load was placed in the center of the oven. The oven was operated at maximum output power for 120 seconds. Then the temperature of the water was re-measured.

Quantity of water (ml)	Starting Temperature (C°)	Final Temperature (C°)	Elapsed Time (seconds)	RF Power (watts)
1000	22.2	34.4	120	427.0
1000	22.8	34.4	120	406.0
1000	22.8	33.9	120	388.5

Average of 3 Trials: 407.2 W

$$\text{Power} = \frac{(4.2 \text{ Joules/Cal}) \times (\text{Volume in ml}) \times (\text{Temp. Rise})}{\text{Time in seconds}}$$

The measured output was found to be BELOW 500Watts. Therefore, in accordance with section 18.305 of Subpart B, the measured out-of-band emissions were compared to the 25 uV/m @ 300M limit.

5.4 OPERATING FREQUENCY MEASUREMENTS

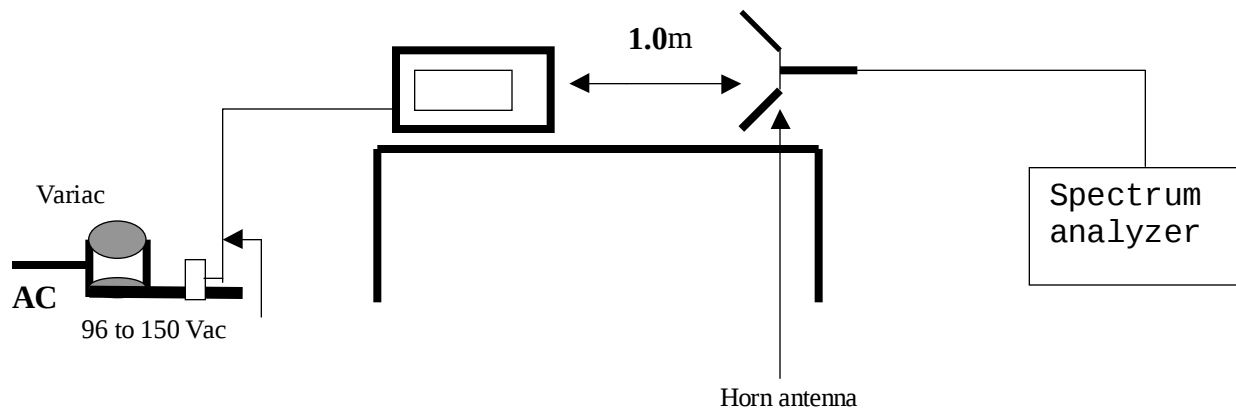


Figure 1. Operating Frequency Measurement Set-up

5.5 VARIATION IN OPERATING FREQUENCY WITH TIME

The operating frequency was measured using a spectrum analyzer. Starting with the EUT at room temperature, a 1000-ml water load was placed in the center of the oven and the oven was operated at maximum output power.

The fundamental operating frequency was monitored until the water load was reduced to 20% of the original load.

The results of this test are as follows.

Initial load: 1000 ml

Load at completion of test: 200 ml

Minimum frequency observed: 2431 MHz

Minimum frequency allowed: **2400 MHz**

Maximum frequency observed: 2465 MHz

Maximum frequency allowed: **2500 MHz**

Refer to spectrum analyzer plot under ATTACHMENTS: **VARIATION IN OPERATING FREQUENCY WITH TIME PLOT** for details of frequency variation with operating time.

5.6 VARIATION IN OPERATING FREQUENCY WITH VOLTAGE

Following the above test, after operating the oven long enough to assure that stable operating temperature were obtained, the operating frequency was monitored as the input voltage was varied between 80 to 125 percent of the nominal rating.

The water load was maintained at 200 ml for the duration of the test.

The results of this test are as follows:

Line voltage varied from 96Vac to 150Vac.

150Vac Minimum frequency observed: 2425 MHz
Minimum frequency allowed: **2400** MHz

Maximum frequency observed: 2477 MHz
Maximum frequency allowed: **2500** MHz

120Vac Minimum frequency observed: 2432 MHz
Minimum frequency allowed: **2400** MHz

Maximum frequency observed: 2468 MHz
Maximum frequency allowed: **2500** MHz

96Vac Minimum frequency observed: 2425 MHz
Minimum frequency allowed: **2400** MHz

Maximum frequency observed: 2481 MHz
Maximum frequency allowed: **2500** MHz

Refer to spectrum analyzer plots under ATTACHMENTS: **VARIATION IN OPERATING FREQUENCY WITH VOLTAGE PLOTS** for details of Frequency variation with operating voltage.

5.7 RADIATED EMISSIONS

Radiated emissions were measured over an inclusive frequency range to 30MHz through the tenth harmonic of the operating frequency. For this test, a 1-meter high wooden table in an open laboratory area supported the device under test. The table was placed on a turntable.

The measurement antenna was placed 10 meters for measurements from 30 - 1000MHz and 1 meter for measurements from 1000 - 25,000MHz, respectively, for the device under test. The indicated frequency range was swept as the device under test was rotated along its vertical axis in 90° increments.

During the preliminary tests, the load consisted of 700-ml tap water placed in the center of the oven. The emissions were observed while the device under test was operated at maximum output power.

The level of the emissions near the edge of the designated ISM frequency band was measured. For this test, the load consisted of 700-ml water load located in the center of the oven.

The levels of the second and third harmonic were measured inclusively with a 300 ml and 700 ml water load alternately placed in the center and right front corner of the oven. Harmonics beyond the third were measured with a 700-ml load placed in the center of the oven. The data obtained during these tests is contained on the attached spreadsheet.

All other out-of-band emissions were measured while a 700-ml load was placed in the center of the oven. Maximum readings were recorded after variations in antenna polarizations, height, device orientation, load position, and size. For frequencies above 1 GHz, the video bandwidth of the spectrum analyzer was set to simulate a linear average detection mode (10Hz).

For all emissions the equivalent 300 meters intensity was calculated assuming a linear decrease in the intensity of the RFI field with increased distance. In the operating modes and conditions described, there were no over-limit emissions discovered.

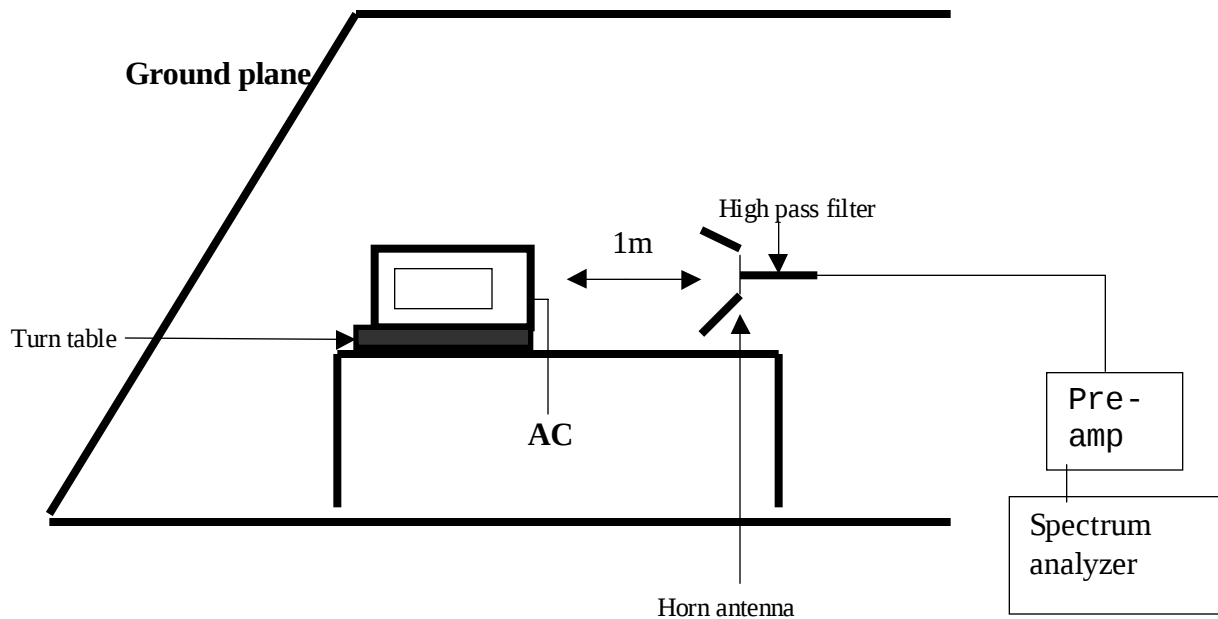


Figure 2. Radiated Emissions Configuration

There were no emissions detected from the EUT in the 30 - 1000 MHz region. Emissions detected in the 1000 - 25,000 MHz region are reported in a spreadsheet under ATTACHMENTS: **RADIATION EMISSION DATA.**

6. MEASUREMENT EQUIPMENT LIST

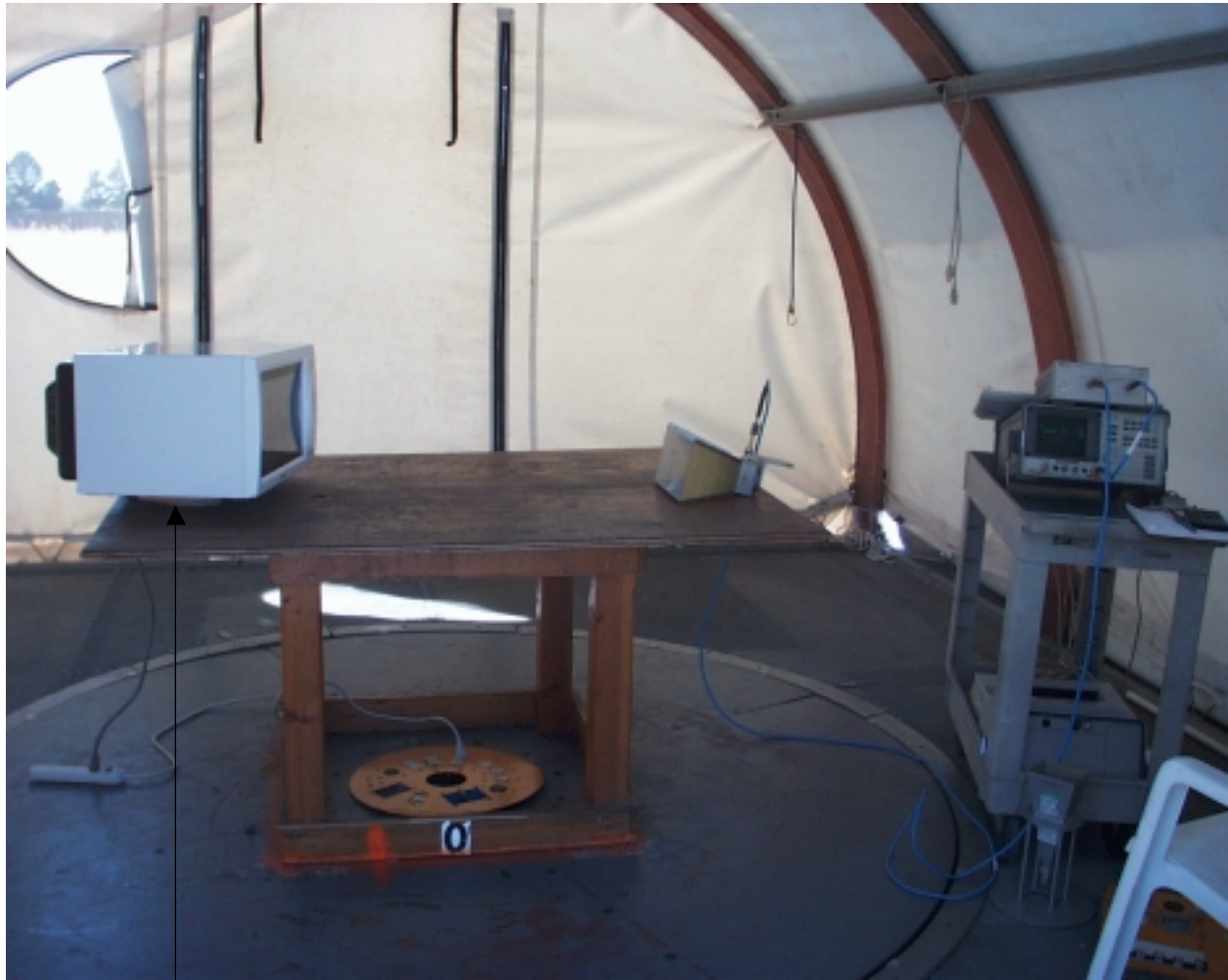
Equipment	Manufacturer	Model No.	Serial No.	Site	Cal Date	Due Date
Spectrum Analyzer	H.P.	8566B	2140A01296	A	12/99	12/00
Antenna	Chase	CBL6112	2049	A	11/99	11/00
Spectrum Analyzer	H.P.	8593EM	3710A00205	F	05/99	05/00
Pre-Amp	Miteq	NSP2600-44	646456	A	12/99	12/00
Horn Antenna	EMCO	3115	9001-3245	A	12/97	12/00
Digital Multimeter	Fluke	87	4035173	A	11/99	11/00
Wattmeter	Valhalla	2111A	33-386	A	10/99	10/00
Variac (0 – 280Vac)	Powerstat	N/A	N/A	A	N/A	N/A
Microwave Leakage Tester	Simpson	380-2	N/A	A	12/99	12/00

7. EUT SETUP PHOTOS.

Below 1 GHz Radiated setup (Front Side)



Below 1GHz Radiated setup (Back Side)



Lazy Susan Turntable

Above 1GHz Radiated Setup



Frequency Vs. Time and Frequency Vs. Voltage Test Setup



Input Power Test Setup



RF Hazard Test Setup

ATTACHMENTS

RADIATION EMISSION DATA

RADIATION EMISSION DATA

VARIATION IN OPERATING FREQUENCY WITH TIME PLOTS

VARIATION IN OPERATING FREQUENCY WITH VOLTAGE PLOTS

VARIATION IN OPERATING FREQUENCY WITH VOLTAGE PLOTS

VARIATION IN OPERATING FREQUENCY WITH VOLTAGE PLOTS

PROPOSED FCC ID LABEL

USER MANUAL AND SCHEMATICS