

FCC CFR47 PART 18 SUBPART C
ISM EQUIPMENT

TEST REPORT

FOR

MICROWAVE OVEN

MODEL: WP800, WP800A

FCC ID: NVZ9803800N

REPORT NUMBER: 98E7340

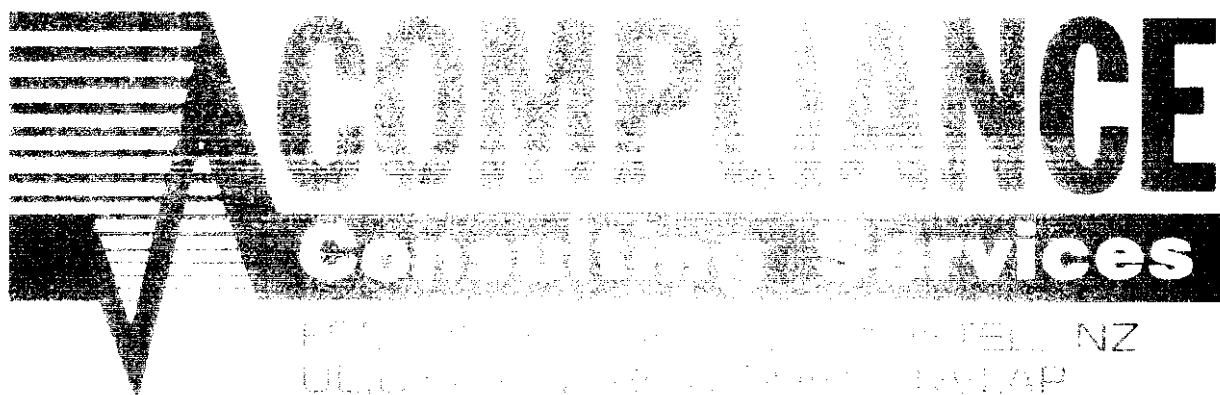
ISSUE DATE: JULY 28, 1998

Prepared for
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NVLAQ®
LAB CODE: 200065-0

LAB CODE:200065-0



ULLMAN, R. 1979. *Journal of the Royal Society of New Zealand* 9: 1-14.

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ATTACHMENTS:

- .RADIATED EMISSION DATA
- .VARIATION IN OPERATING FREQUENCY WITH TIME PLOTS
- .VARIATION IN OPERATING FREQUENCY WITH VOLTAGE PLOTS
- .USER MANUAL AND SCHEMATICS
- .PROPOSED FCC ID LABEL
- .EUT PHOTOGRAPHS

1. VERIFICATION OF COMPLIANCE

COMPANY NAME : GUANGDONG GALANZ ENTERPRISE(GROUP) CO., LTD.
328 GUIZHONG ROAD
SHUNDE, GUANGDONG P.R.C. 528305
CHINA

CONTACT PERSON : HU YANG / MANAGER

TELEPHONE NO : 765-888-6389

EUT DESCRIPTION: MICROWAVE OVEN

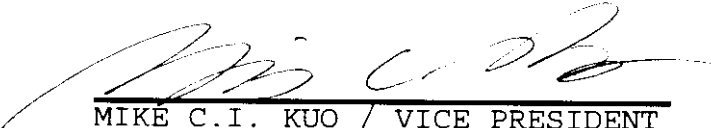
MODEL NO/NAME : WP800 AND MP800A

DATE TESTED : JULY 28, 1998

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. This said equipment in this configuration described in this report shows that maximum emission levels emanating from equipment are within the compliance requirements.

Approved By


MIKE C.I. KUO / VICE PRESIDENT
COMPLIANCE CERTIFICATION SERVICES

2. PRODUCT DESCRIPTION

The equipment under test is a microwave oven sold for consumer use. Models: WP800A is a 800W microwave oven with digital controls and WP800 is a 800W microwave oven with mechanical controls.

Megnetron: Panasonic, Model: 2M210-M1.

3. TEST FACILITY

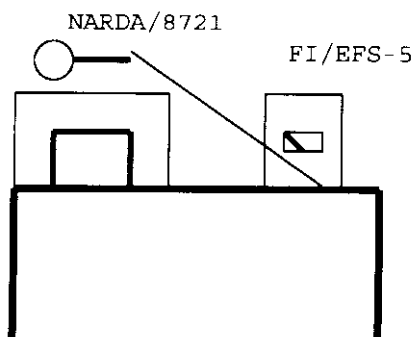
The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

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 10(100%) maximum power. While the oven was operating, the STE probe was moved slowly around the door seams to check for leakage.

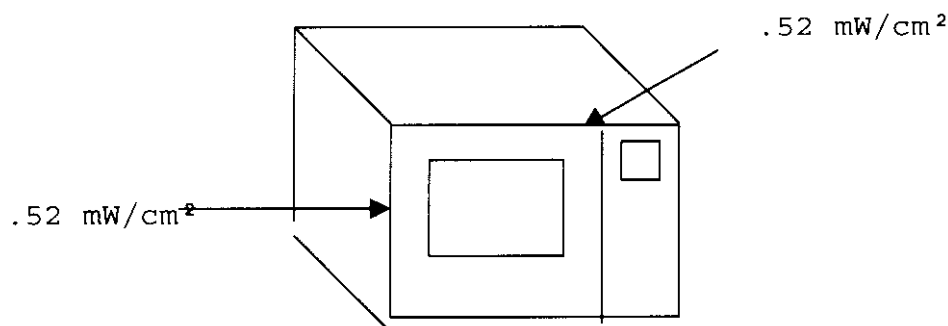


fig.1

<u>LOCATION</u>	<u>MAXIMUM LEAKAGE</u> (mW/cm ²)	<u>LIMIT</u> (mW/cm ²)
Fig.1 shows the locations of maximum leakage	.52	1.0
All others	.13	1.0

5.2 INPUT POWER

Input power and current were measured using a wattmeter and an ammeter. A 275 ml water load was placed in the center of the oven and the oven was set to 10(100%) maximum power. A 275-ml water load was chosen for its compatibility. Manufacturers to determine their input ratings commonly use this procedure.

<u>Input</u> <u>Voltage</u> <u>(Vac)</u>	<u>Input</u> <u>Current</u> <u>(amps)</u>	<u>Measured</u> <u>Input power</u> <u>(watts)</u>
1300W: 120	15	1332

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	26.6	42.7	120	563.5
1000	25.5	41.6	120	563.5
1000	14.9	31.1	120	567.0

Average of 3 Trials: 564.6 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 OVER 500Watts. Therefore, in accordance with section 18.305 of Subpart B, the measured out-of-band emissions were compared to the $25 \sqrt{\text{Power}/500}$ @ 300M limit.

5.4 OPERATING FREQUENCY MEASUREMENTS

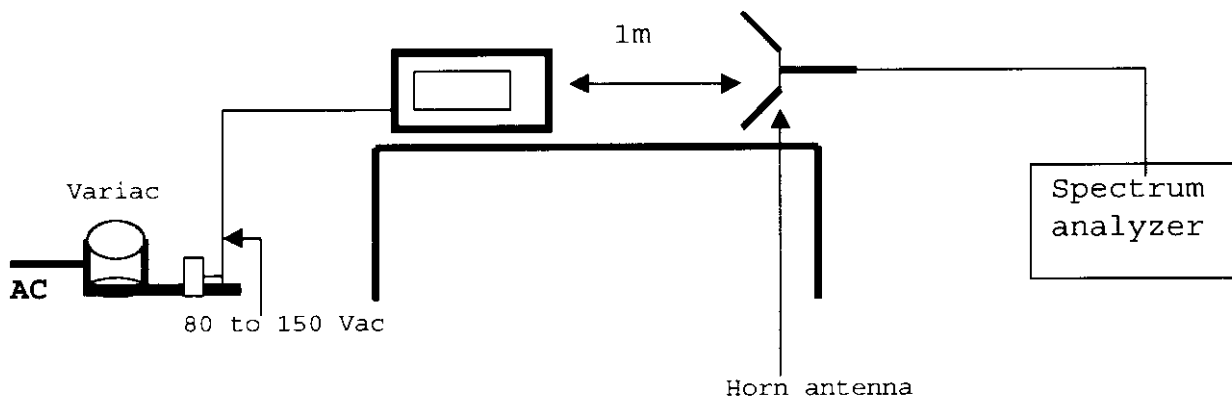


Figure 1. Operating Frequency Measurement Set-up

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 monitor 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

Maximum frequency observed: 2467 MHz

Maximum frequency allowed: 2500 MHz

Minimum frequency observed: 2436 MHz

Minimum frequency allowed: 2400 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 Maximum frequency observed: 2468 MHz
Maximum frequency allowed: **2500** MHz

Minimum frequency observed: 2439 MHz
Minimum frequency allowed: **2400** MHz

120Vac Maximum frequency observed: 2467 MHz
Maximum frequency allowed: **2500** MHz

Minimum frequency observed: 2436 MHz

Minimum frequency allowed: 2400 MHz

96Vac Maximum frequency observed: 2467 MHz
Maximum frequency allowed: 2500 MHz

Minimum frequency observed: 2431 MHz
Minimum frequency allowed: 2400 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 100MHz through the sixth 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 100 - 1000MHz and 1 meter for measurements from 1000 - 14,000MHz, 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.

The maximum of 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.

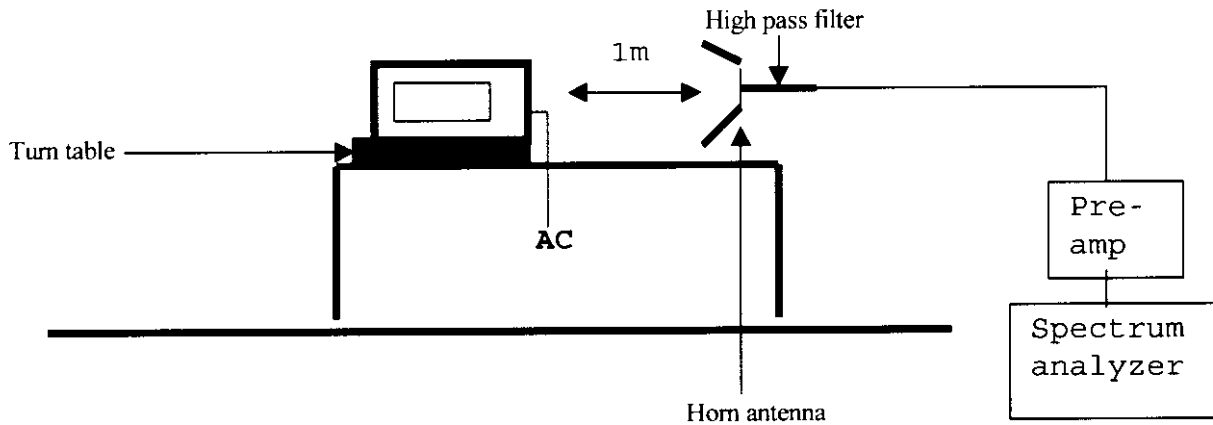


Figure 2. Radiated Emissions Configuration

There were no emissions detected from the EUT in the 100 - 1000 MHz region. Emissions detected in the 1000 - 14,000 MHz region are reported in a spreadsheet under ATTACHMENTS: **RADIATION EMISSION DATA**.

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EUT: MICROWAVE OVEN

DATE: JULY 28, 1998

FCC ID: NVZ9803800N

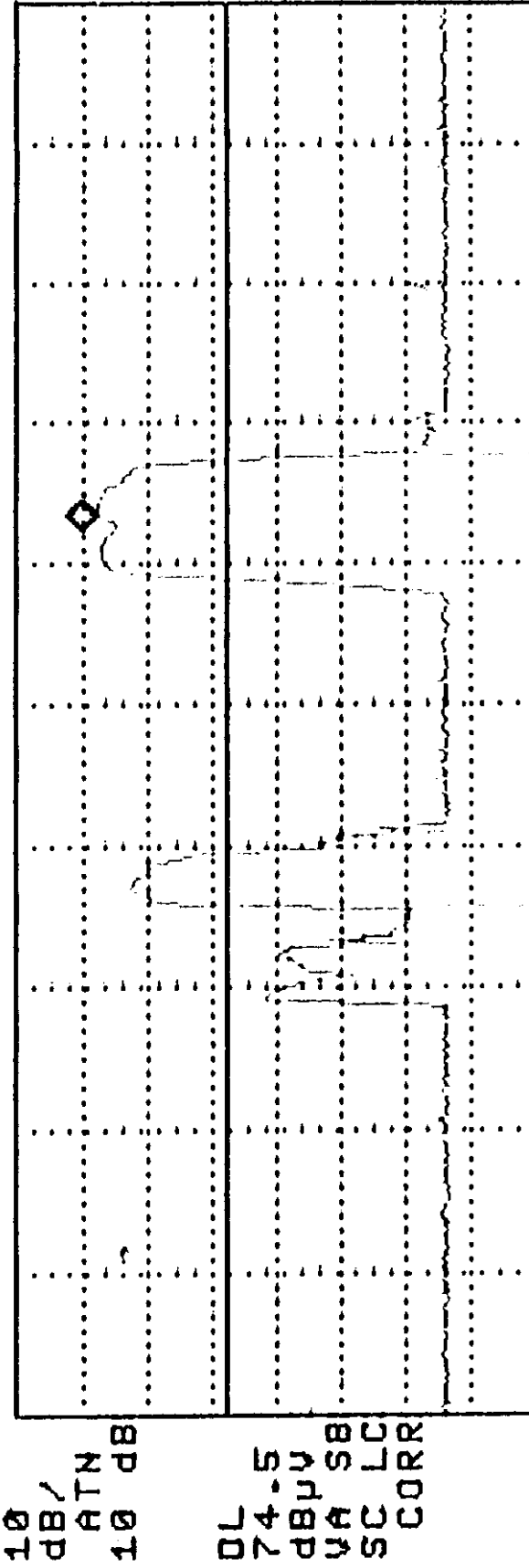
7. MEASUREMENT EQUIPMENT LIST

Equipment	Manufacturer	Model No.	Serial No.	Site	Cal Date	Due Date
Receiver	H.P.	8546A	3520A00259	A	03/98	03/99
RF Filter Section	H.P.	85460A	3448A00232	A	03/98	03/99
Antenna	Chase	CBL6112	2049	A/F	05/98	05/99
Spectrum Analyzer	H.P.	8593EM	3710A00205	F	05/98	05/99
Quasi-peak Detector	H.P.	85650A	3145A01654	F	07/98	07/99
Pre-Amp	H.P. (1-26.5GHz)	8449B	3008A00369	A	04/98	04/99
Horn Antenna	EMCO	3115	9001-3245	A	12/97	12/00
Digital Multimeter	Fluke	87	4035173	A	11/98	11/99
Wattmeter	Valhalla	2111A	33-386	A	10/98	10/99
Variac(0 - 280Vac)	Powerstat	N/A	N/A	A	N/A	N/A

11:22:32 JUL 29, 1998
 GALANZ WP800A FREQ OVER TIME

ACTV DET: PEAK
 MEAS DET: PEAK QP AVG
 MKR 2.4635 GHZ
 94.56 dBμV

LOG REF 107.0 dBμV



START 2.4000 GHZ #IF BW 1.0 MHZ #AVG BW 1 MHZ STOP 2.5000 GHZ
 SWP 20.0 msec

467GHZ

2436G

COMPLIANCE CERTIFICATION SERVICE

GALANZ

WP800A MICROWAVE OVEN

FCC 18

PETE KREBILL

7/29/98

F(MHz)	Level (dBuV)	AF (dB)	CL (dB)	AMP (dB)	DIST (dB)	FILTER (dB)	Total (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarity
4900PK	85.43	34.3	4.32	-35.5	-50	1	39.55	50	-10.45	H
4900AV	62.2	34.3	4.32	-35.5	-50	1	16.32	30	-13.68	H
7350PK	73.9	36.4	6.08	-35.5	-50	1	31.88	50	-18.12	H
7350AV	52.4	36.4	6.08	-35.5	-50	1	10.38	30	-19.62	H
9800PK	67.42	38.2	7.04	-35.5	-50	1	28.16	50	-21.84	H
9800AV	48.9	38.2	7.04	-35.5	-50	1	9.64	30	-20.36	H

AF=ANTENNA FACTOR

CL=CABLE LOSS

AMP=AMPLIFIER GAIN

DIST=DISTANCE CORRECTION TO 300 METERS

FILTER=FILTER LOSS

RES B/W=1MHZ PEAK

VID B/W=1MHZ PEAK

RES B/W=1MHZ AVERAGE

VID B/W=10HZ AVERAGE

ALL READINGS ARE MAXIMUM FOR ANTENNA POLARITY

10:34:26 JUL 29, 1998
GALANZ WP800A 150VAC

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4625 GHz
92.66 dB μ V

LOG REF 107.0 dB μ V

10

dB/

ATN

10 dB

DL

72.7

dB μ V

VA SB

SC LC

CORR

START 2.4000 GHz

#IF BW 1.0 MHz

#AVG BW 1 MHz

STOP 2.5000 GHz

SWP 20.0 msec

11:22:32 JUL 29, 1998
GALANZ WP800A 120VAC

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4635 GHz
94.56 dB μ V

LOG REF 107.0 dB μ V

10

dB/

ATN

10 dB

DL

74.5

dB μ V

VA SB

SC LC

CORR

START 2.4000 GHz

#IF BW 1.0 MHz

#AVG BW 1 MHz

STOP 2.5000 GHz

SWP 20.0 msec

12:07:57 JUL 29, 1998
GALANZ WP800A 96VAC

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4635 GHz
91.75 dB μ V

LOG REF 107.0 dB μ V

10

dB/

ATN

10 dB

DL

71.8

dB μ V

VA SB

SC LC

CORR

START 2.4000 GHz

#IF BW 1.0 MHz

#AVG BW 1 MHz

STOP 2.5000 GHz

SWP 20.0 msec