

27-Feb-03

ELECTROMAGNETIC RADIATION TEST OF MICROWAVE OVEN

Report No. CALR-FCC-222

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This is to certify that the MICROWAVE OVEN from which the following data have been derived through the required measurements in Panasonic's test facility that have been filed with FCC file No. 31010/EQU 4-3-0A.

Oven Model : R-1200
Magnetron Model : 2M167

1. Power Density Safety Check

Condition	Load - Water 275cc center
Equipment	Narda 8110B
Power density	0.3(mW/cm ²)

2. Input Power

Line Volt (V)	Input I (A)	Input Power (W)	Load Condition
120	15.1	1812	1500cc / 20 degC

3. Output Power

Condition	Water load : 1500cc / 20 deg C, Tim : 120sec		
Temp 1 (deg C)	Temp 2 (deg C)	T2 - T1 (deg C)	Output Power(W)
20.00	37.80	17.80	930.1

4. Harmonics

Harmonics	Frequency (MHz)	Load Condition	FIS(uV/m) @300m
2nd	4923	450cc center	10.35
3rd	7910	1050cc center	1.53
4th	10197	1050cc center	1.51

Note : 2nd and 3rd Harmonics are measured with load 450cc and 1050cc in the center or right front position.

5. Permissible

Formula	$SQR(930.1/500) \times 25 \mu V/m$ @300m
Permissible	34.10

6. Side Band

Frequency (MHz)	FIS(μ V/m) @300	Load Condition
2400	0.23	1050cc center
2500	0.26	1050cc center

7. Frequency Run

(1) Frequency VS Line Voltage Variation Test

Test Results (Room Temperature : 20 deg C)

Line Voltage Variation (V)	Frequency (MHz)	Deviation for ISM Frequency (MHz)
150 (125%)	2464	14
135 (112.5%)	2466	16
120 (Nominal)	2464	14
108 (90%)	2465	15
96 (80%)	2466	16

Load : 1500 cc water

(2) Frequency VS Load Variation Test

Test Results (Room Temperature : 20 deg C)

Volume of water (cc)	Frequency (MHz)	Deviation for ISM Frequency (MHz)
1500	2464	14
1200	2470	20
900	2470	20
600	2473	23
300	2469	19

Load : 1500 cc water

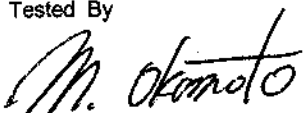
8. Fundamental Level

Frequency (MHz)	FIS(dBuV/m) @3m	Load condition
2458	108.00	1050cc center

9. Spurious any emission < 2400MHz & > 2500MHz excluding Harmonics

Frequency (MHz)	FIS(dBuV/m) @3m	Load condition
2625	32.2	1050cc center

Tested By



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Description of Instrumentation and calculation

(1) Measurement equipment

a. Field Strength Meter : Electro-Metrics Model EMC-50

Bandwidth Setting : 1 MHz

Detector Function : Linear Average Detection

b. Receiving Antenna : Electro-Metrics Model RGA-180

Frequency Range : 1 - 18 GHz

c. Microwave Survey Meter : Narda Model 8110B

(2) Test Condition

a. Antenna Height Variation : 1.0 - 1.5 m

b. Distance of Antenna to Test unit : 3.0 m

c. Test Unit Height : 1.0 m

(3) Calculation Formula

Field Strength at 3 m (dBuV/m)

$$= \text{Receiver Reading (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)}$$

Field Strength at 300 m (dBuV/m)

$$= K * 10^{\frac{\text{Field Strength at 3 m (dBuV/m)} - 20}{20}}$$

K : Conversion Factor for 3 m to 300 m

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Conv. Factor K
2400	29.0	0.7	0.0061
Fundamental	29.3	0.7	0.0062
2500	29.5	0.7	0.0063
4900	33.4	0.9	0.01
7350	36.5	1.2	0.01
9800	38.2	1.4	0.01

Example : 2nd Harmonics

Receiver Reading = 20 dB @ 3 m

$$\text{FIS @300 m} = 0.01 * 10^{\frac{20 + 33.4 + 0.9}{20}} = 5.19(\mu\text{V/m})$$

Fig. 1 Physical Description of Test Site

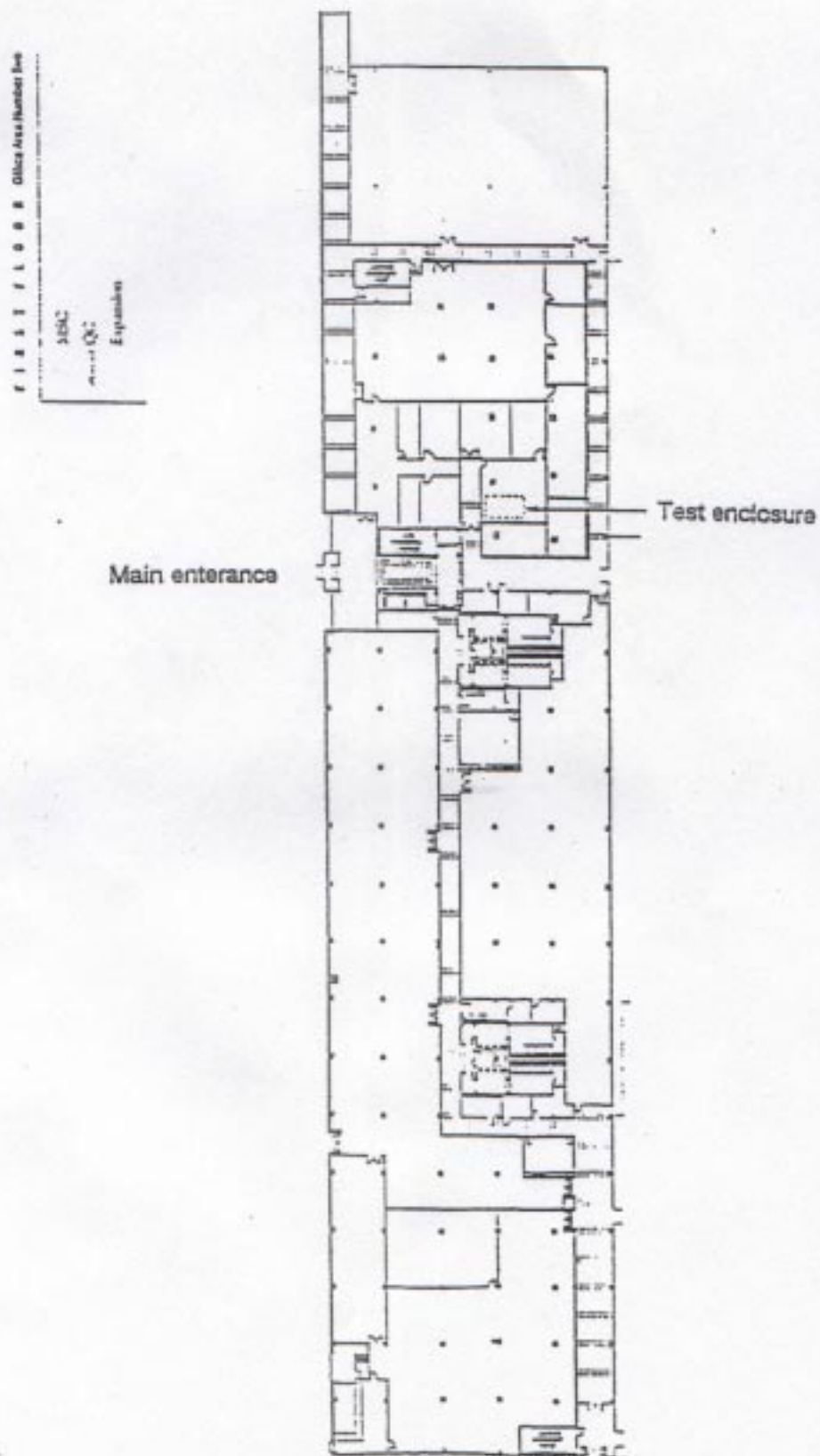


Fig. 2 Physical Dimensions of Test Site (Unit mm)

