Fig.15

Panasonic

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Mr. R. Kanemitsu
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R & D department
Nissin Industry Co. Ltd.
3-2-11 Shibukawa-cho,
Higashi Osaka city
Japan

Re: Electromagnetic radiation from microwave oven with Matsushita magnetron 2M211A-M2

Dear Mr. Kanemitsu

We are enclosing herewith an electro magnetic radiation test result based on FCC measuring method FCC/OST MP-5 in our measuring facility of FCC file number 31010/EQU4-3-0A.

We confirmed that test results are satisfied the FCC limit.

Sincerely yours,

M. Okamoto

Mitsuhiro Okamoto
Application manager of magnetron

(Reference number of report: CARL-FCC-221)

Electromagnetic radiation test of microwave oven

The following measurements were conducted in Panasonic Industrial company measurement facility of FCC file number 31010/EQU 4-3-0A

1. Description of oven

Manufacturer of the oven	: Nisshin Industry Co., Ltd.
Model name	: MO-655
Line voltage	: 120V / 60Hz
Output RF power(IEC705)	: 600W / 2450MHz
Magnetron	: Matsushita 2M211A-M2

2. Equipment class : Part 18

3. Test procedure : FCC / OST MP-5

4. Date of measurement : January 16, 2003

5. Measurement data

5-1. Output power (Load: 1000ml water / center)

Input power	: 1201W
Output power	: 504W
Permissible FIS	: 25.10μV/m

$$\text{FIS} = 25\sqrt{\text{Output power} / 500}$$

FIS = Field Intensity Strength

5-2. Power leak (Load : 275ml water / center)

Po leak : 0.4mW/cm²

5-3. FIS measurements

Band	Frequency (MHz)	$FIS_{@300m}$ (μV/m)	Permissible $FIS_{@300m}$ (μV/m)	Load
Side band	2317	0.21	25.10	700ml / center
Side band	2622	0.25		700ml / center
2nd harmonic	4932	2.60		700ml / center
3rd harmonic	7766	1.22		700ml / center
4th harmonic	10230	1.51		700ml / center

Note 2nd and 3rd harmonics : The higher FIS value of 300ml or 700ml load at center or side in the cavity is taken.

5-4. Frequency sweeping

None of higher FIS value than those shown in the above table was observed in the following frequency band.

Frequency (MHz)	Load condition
1000 - 2400	700ml / center
2500 - 4100	
4100 - 7700	300ml or 700ml / center or side
7700 - 18000	700ml / center

Fig. 17

5-5. Frequency measurements

The variation of frequency for load variation (Load : 1000ml water / center)

Volume of water (ml)	Frequency (MHz)
1000	2465
800	2468
600	2467
400	2466
200	2470

The variation of frequency for line voltage variation (Load : 1000ml water / center)

Line voltage (V)	Frequency (MHz)
96	2464
108	2464
120	2465
132	2463
150	2465

6. Description of instruments and calculation

6-1. Measurement equipment

Interference analyzer : EMC-50 (Band width: 1MHz, Linear average detection)
Antenna : RGA-180
Microwave survey meter : Narda 8110B

6-2. Test condition

Distance of antenna to oven : 3.0m
Antenna height range : 1.0 - 1.5m
Turn table height : 0.8m

6-3. Calculation formula

$FIS_{@3m}$ (dBμV/m) = Analyzer reading + Antenna factor + cable loss

$FIS_{@300m}$ (μV/m) = $K \times 10^{FIS_{@3m}/20}$

Antenna factor

Band	Frequency (MHz)	Antenna	Antenna factor (dB/m)	Cable loss (dB)	K
Fundamental	2450	RGA-180	29.3	0.7	0.0061
2nd harmonic	4900	RGA-180	33.4	0.9	0.01
3rd harmonic	7350	RGA-180	36.5	1.2	0.01
4th harmonic	9800	RGA-180	38.2	1.4	0.01

Example : 2nd harmonics

Analyzer reading = 20 dB

FIS $= 0.01 \times 10^{(20+33.4+0.9)/20}$ = 5.19 (μV/m)

7. Measurement equipment : Refer to "Exhibit 1"

Fig. 18

Exhibit 1 Test Equipment List

Name / Model No.	S / No.	Manufacturer	Last Calibrated
Field Strength Meter Model EMC - 50	175	Electro Metrics	05 / 16 / 02
Microwave Survey Meter 8110B	20915	Narda	09 / 26 / 01
Ridged Guide Antenna RGA - 180	2455	Electro Metrics	08 / 20 / 88
Network Analyzer 8410B	1647A00704	Hewlett Packard	06 / 17 / 88
Reflection Unit 8743A	1330A01358	Hewlett Packard	06 / 17 / 88
Sweep Oscillator 8620C	1645A00827	Hewlett Packard	06 / 17 / 88
Frequency Meter 536A	1441A00695	Hewlett Packard	09 / 17 / 88
Power Meter 436A	1629A1172	Hewlett Packard	08 / 05 / 89
Spectrum Analyzer 8555A	1642A06830	Hewlett Packard	08 / 21 / 88

Fig. 19

Fig. 1 Physical Description of Test Site

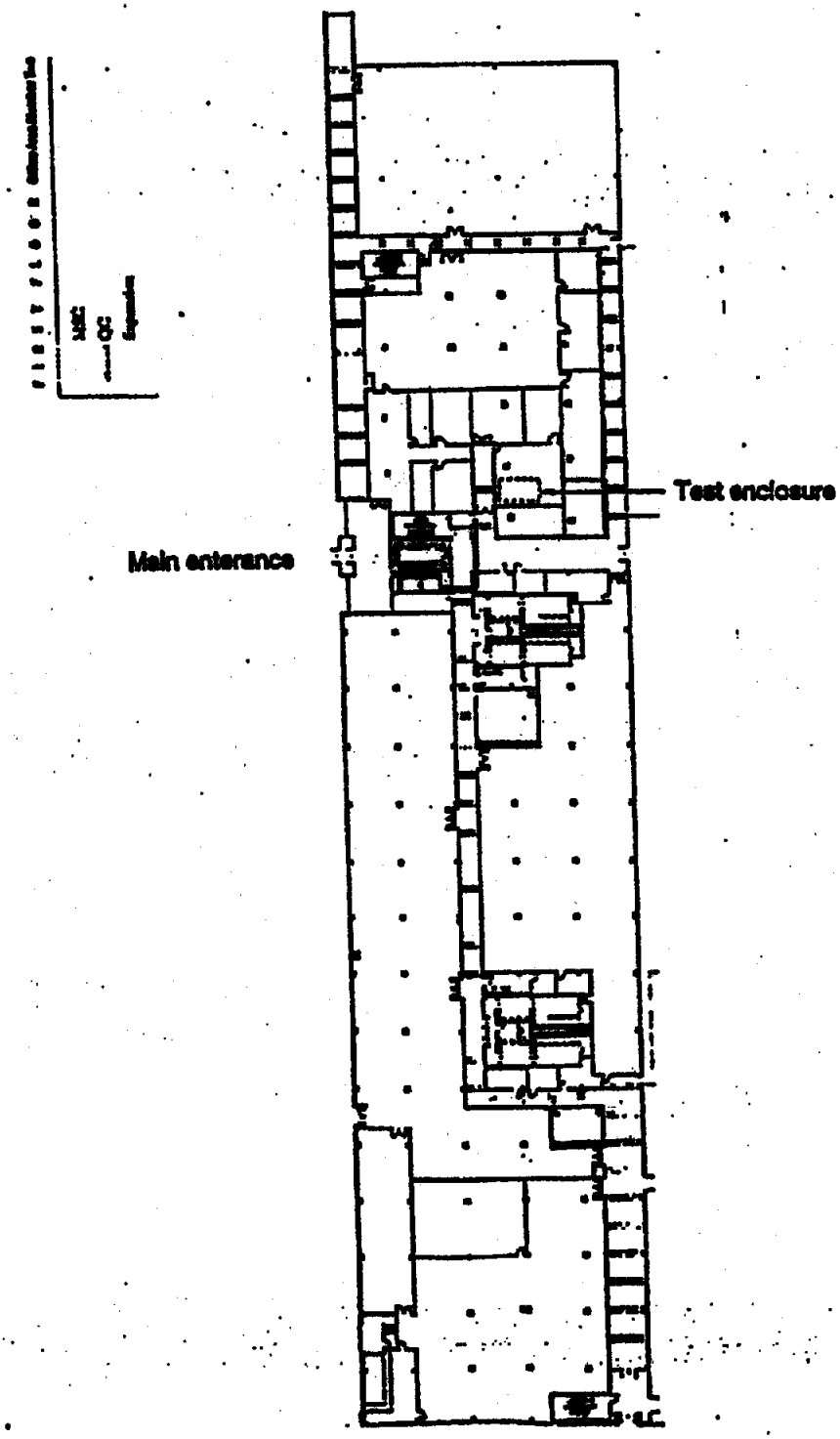

Fig. 20

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