TOSHIBA

TOSHIBA HOKUTO ELECTRONICS CORPORATION

MAGNETRON ENGINEERING GROUP
1975, 23-CHOME MINAMI 5-JODORI, ASAHIKAWA, HOKKAIDO 078-8335, JAPAN
PHONE : (0166) 31-4728 FACSIMILE : (0166) 31-4739

DAEWOO ELECTRONICS CO., LTD.
Microwave oven R&D Center
#412-2, Chongchon 2-Dong, Pupyong-Ku,
Inchon, KOREA

February 21, 2001
(Ref. No. : 01-026)

RE : Electromagnetic radiation from microwave oven KOT-170U with Daewoo magnetron 2M218

Dear Sirs :

We are enclosing herewith the above mentioned test results based on FCC measuring method in our measuring facility of FCC file number 430A.

We confirmed test results are satisfied with FCC limit.

Please feel free to contact us, if you have any question or request.

Sincerely yours,

Toshiki Azuma
Manager
Magnetron Engineering Group

AZ/sw

cc : Mr. Ikegami TOSHIBA HOKUTO TOKYO

Electromagnetic radiation test of microwave oven

The following measurements were conducted in Toshiba Hokuto Electronics Corporation measurement facility of FCC file number 430A.

1. Description of oven

Manufacturer of oven	: DAEWOO ELECTRONICS CO., LTD.
Model name	: KOT-170U
Line voltage	: 120V/60Hz
Output RF power	: 1100W/2450MHz
Magnetron type	: Daewoo 2M218

2. Equipment class : Part 18 Consmer Dvice

3. Test procedure : FCC/OST MP-5

4. Date of measurement : February 20, 2000

5. Measurement data

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

Input power	: 1700W	
Output power	: 1100W	
Permissible FIS $_{@300m}$	: 37.1 μ V/m	$= 25\sqrt{\text{Output power} / 500}$

FIS : Field Intensity Strength

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

Po leak : 1.5 W/m^2

5-3. FIS measurements

Band	Frequency (MHz)	FIS $_{@300m}$ (μ V/m)	Permissble FIS $_{@300m}$ (μ V/m)	Load
Side band	2136	5.4	37.1	700ml/ center
Side band	2500	10.1		700ml/ center
2nd harmonic	4900	16.4		700ml/ center
3rd harmonic	7350	6.1		300ml/ side
4th harmonic	-	Background Noise		-

Note 2nd and 3rd harmonics : The maximum value with the load condition such as 300ml or 700ml water in the center or side position.

5-4. Frequency sweeping

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

Frequency (MHz)	Load condition
2000 - 2400	700ml / center
2500 - 4100	
4100 - 7700	300ml or 700ml / center or side
7700 - 10000	700ml / center

5-5. Frequency measurements

The variation of frequency for load variation

Volume of water (ml)	Frequency (MHz)
1000	2453
800	2455
600	2453
400	2450
200	2450

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

Line voltage (V)	Frequency (MHz)
96	2454
108	2454
120	2451
132	2454
150	2452

6. Description of instrumentation and calculation

6-1. Measurement equipment (Refer Page-4)

Interference analyzer : EMC-60 MK-Ⅳ (Bandwidth : 5MHz, Detecter function : Linear average)
Antenna : CA-S, CA-M and CA-X

6-2. Test condition

Distance of antenna to oven : 3.0m
Antenna height range : 0.5m - 1.8m
Turn table height : 0.8m (360 degree movable)

6-3. Calculation formula

$FIS_{@3m}$(dBμv/m) = Analyzer reading(dBμv) + Antenna factor(dB/m) + Cable loss(dB)
$FIS_{@300m}$(μv/m) = K × 10 ^ ($FIS_{@3m}$ / 20)

K : Conversion factor for 3m to 300m

Antenna factor and Cable loss for our equipment are as follows :

Band	Frequency (MHz)	Antenna	Antenna factor (dB/m)	Cable loss (dB)	K
Fundamental	2450	CA-S	21.8	1.174	0.0062
2nd harmonic	4900	CA-M	39.1	1.288	0.01
3rd harmonic	7350	CA-M	39.2	1.397	0.01
4th harmonic	9800	CA-X	42.5	1.679	0.01

Example : 2nd harmonics

Analyzer reading = 22(dBμv)
$FIS_{@300m}$ = 0.01 × 10 ^ ((22 + 39.1 + 1.288) / 20) = 13.1 (μv/m)

7. Measurement equipment : Attached please find "Measurement equipment"(Refer Page-4).

Table 1 Measurement equipment

No.	Equipment name	Model name & manufacturer	Specifcation	Last calibration date	Calibration frequency
1	Interference analyzer	EMC-60 MK-IV Ser. : 44116 Electro-metrics	0.5 to 18 GHz	March 2000	
2	Antenna	(1) CA-S Ser : 22-1 Polarad	2.1 to 4.34 GHz		
		(2) CA-M Ser : 20-15 Polarad	4.19 to 7.74 GHz		
		(3) CA-X Ser : 20-10 Polarad	7.36 to 10 GHz		
3	Signal generator	8671B Ser : 2545A00106 Hewlett packard	2.0 to 18 GHz	March 2000	
4	Frequency counter	85340A Ser : 134A01280 Hewlett packard		March 2000	Annually
5	Power meter	435A Ser : 1312J00144 Hewlett packard	0 to 1 mW	March 2000	Annually
6	Power sensor	8481A Ser : 1234A871 Hewlett packard		March 2000	
7	Spectrum analyzer	8562A SER : 2923A03932 Hewlett packard	1 kHz to 22 GHz	March 2000	

Unit : mm

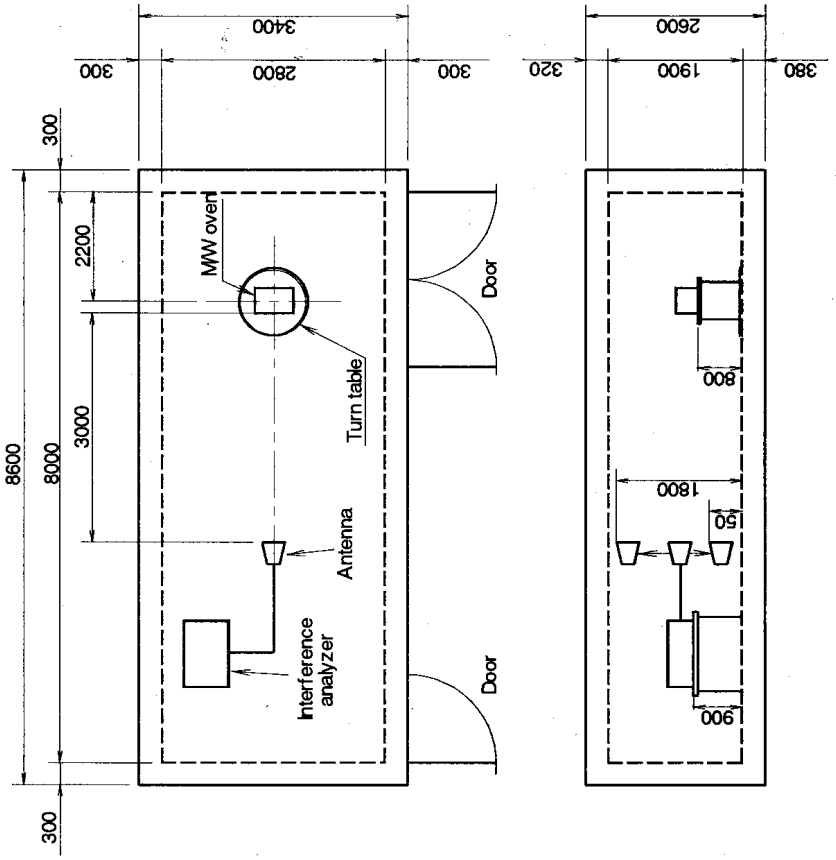

Fig. 1 Environmental condition

Fig. 2 Physical description of test site