

# TOSHIBA

TOSHIBA HOKUTO ELECTRONICS CORPORATION

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Sharp Manufacturing Company  
of America

Nov. 30, 1999  
(Ref. No. : 99-169)

RE : Electromagnetic radiation from microwave oven VF-A  
with Toshiba magnetron 2M248

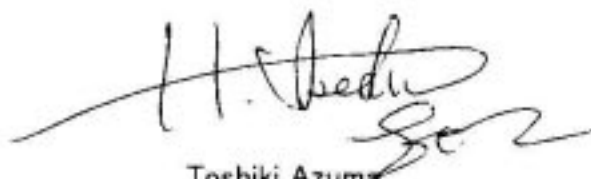
Dear sir

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 Application Engineering  
Magnetron Engineering Department

SJ/is/us

cc : Mr. Murata TOSHIBA TOKYO  
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.

Date : 1999-11-30  
Oven : VF-A  
Tube : 2M248J(L)-NK  
Line : 120V/60Hz

### 1. Output power (Load : 1500ml water (center))

Input power : 1620W  
Output power : 950W  
\* Permissible FIS =  $34.5 \mu\text{V/m}$  at 300m  
(FIS : Field Intensity Strength)

### 2. Power Leak (Load : 275ml water (center))

Po leak :  $0.2 \text{ mW/cm}^2$

### 3. FIS measurements

Measurement equipment (Refer Page-4)

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

#### 3-1 Side band radiation (Load : 1050ml water (center))

| Frequency (MHz) | FIS ( $\mu\text{V/m}$ ) at 300m |
|-----------------|---------------------------------|
| 2391            | 9.5                             |
| 2512            | 1                               |

#### 3-2 Harmonics radiation

| Harmonics | Load          | FIS ( $\mu\text{V/m}$ ) at 300m | Frequency (MHz) |
|-----------|---------------|---------------------------------|-----------------|
| 2nd       | 1050ml center | 13.4                            | 4940            |
| 3rd       | 450ml side    | 12.4                            | 7415            |
| 4th       | 1050ml center | 9.4                             | 10255           |

Note : 2nd and 3rd Harmonics : The maximum value with the load condition such as 450ml or 1050ml water in the center or side position

#### 4. Frequency measurements

Measurement equipment (Refer Page-4)

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

##### 4-1 The variation of frequency for load variation ( Load : 1500ml water center)

| Volume of water (ml) | Frequency (MHz) |
|----------------------|-----------------|
| 1500                 | 2471            |
| 1200                 | 2472            |
| 900                  | 2469            |
| 600                  | 2466            |
| 300                  | 2466            |

##### 4-2 The variation of frequency for line voltage variation ( Load : 1500ml water center)

| Line voltage (V) | Frequency (MHz) |
|------------------|-----------------|
| 96               | 2471            |
| 108              | 2471            |
| 120              | 2471            |
| 132              | 2469            |
| 150              | 2469            |

#### 5. Frequency sweeping

Measurement equipment (Refer Page-4)

Spectrum analyzer : HP8562A  
Antenna : CA-S, CA-M and CA-X

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

| Frequency (MHz) | Load condition                                          |
|-----------------|---------------------------------------------------------|
| 2000 - 2400     | 1050ml center                                           |
| 2500 - 4000     |                                                         |
| 4000 - 8000     | 450ml or 1050ml water<br>in the center or side position |
| 8000 - 10000    | 1050ml center                                           |

| No. | Equipment Name        | Model Name & Manufacturer                       | Specification    | Last Calibration Date | Calibration Frequency |
|-----|-----------------------|-------------------------------------------------|------------------|-----------------------|-----------------------|
| 1   | Interference Analyzer | EMC-60 MK-IV<br>SER. : 44116<br>ELECTRO-METRICS | 0.5 to 18 GHz    | March 1999            |                       |
| 2   | Antenna               | (1) CA-S<br>SER : 22-1<br>POLARAD               | 2.1 to 4.34 GHz  |                       |                       |
|     |                       | (2) CA-M<br>SER : 20-15<br>POLARAD              | 4.19 to 7.74 GHz |                       |                       |
|     |                       | (3) CA-X<br>SER : 20-10<br>POLARAD              | 7.36 to 10 GHz   |                       |                       |
| 3   | Signal Generator      | 8671B<br>SER : 2545A00106<br>HEWLETT PACKARD    | 2.0 to 18 GHz    | March 1999            |                       |
| 4   | Frequency Counter     | 85340A<br>SER : 134A01280<br>HEWLETT PACKARD    |                  | March 1999            | Annually              |
| 5   | Power Meter           | 435A<br>SER : 1312J00144<br>HEWLETT PACKARD     | 0 to 1 mW        | March 1999            | Annually              |
| 6   | Power Sensor          | 8481A<br>SER : 1234A871<br>HEWLETT PACKARD      |                  | March 1999            |                       |
| 7   | Spectrum Analyzer     | 8562A<br>SER : 2923A03932<br>HEWLETT PACKARD    | 1 kHz to 22 GHz  | March 1999            |                       |